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Editorial Offices: 19 West 44th Street, New York.

VOLUME X NUMBER FIVE

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Easter

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Vol. X. NEW YORK, APRIL, 1928 No. 5

"I still have my April, and
my hope to begin anew"

Beginnings

By Jeff McDermid

PUSSYWILLOWS first lured me away from the glory of the "gang," marbles, one-old-cat, and mumblety-peg; — pussywillows and two little girls in the fusty ginghams of the far-off Nineties.

I do not know where those chubby cherubs of the sticky hands and pig-tail braids may be at present, but I surmise that one of them is a Texas matron, and I believe the other is a self-sufficient business woman who has outwardly eschewed spring fever, daisy petals, and romance.

I do not know whether pussywillows grow amid the cacti of Texas, but I am certain that the skyscraper spinster sees them only in the pages of the home and garden magazine which she takes on the sly—like her fags.

But they grow all about my bucolic domain, and I can still clasp two little girls by the hands and go out marshward with nearly all the thrilling chivalry that I possessed in my tumultuous teens.

Who can say he fares better, with the warmth of April in the soil and the senses? I have lost some ego and much elasticity, as well as a few permanent teeth; but I still possess the pussywillows and the girls to go after

them. I still have my April, and my hope to begin adventuring anew.

If there are any earlier beginnings of returning spring in the North than pussywillows and pasque flowers I have yet to find them.

April is the month of beginnings. All Fool's Day ushers it in, and the lyrical license bureau is sadly overworked to keep the race of versifiers supplied with poetic privileges.

From time immemorial the ruralite has scanned his calendar with stifled winter impatience, yearning for the last cold breath of March to pass away and make room for the blustering rains of April.

The reason is obvious. It lies in the human desire to make a new beginning—to take a fresh start, to bury the past in the rubbish of the mellow furrow and press new callouses on the palms at the plow handles.

Examination reveals, however, that what each man of the land imagines to be the antechamber to the season's hall of plenty is perhaps nothing entirely of the sort.

THE spring equinox is the visible and plainly physical manifestation of forces that have been seemingly dormant for a frigid season. The soil plentifully supplied with chemicals and organic accumulations undergoes a constant laboratory process. During the frosty days when we were listening to the radio by the fireside or conning over the alluring seed catalogs, there were processes going on which challenge our old conception that April plays the real overture to the Dance of Demeter.

Consequently, one finds that the crop quality of this year is limited in some striking ways by the crops that have gone before it on that same land. That is, the crop may be the better or the worse because of seeds produced in some former season; by the treatment given to the land at some former time; or by the residual effect of some crop whose roots have become a wholesome or a fearsome force on that domain.

If the men who have written the songs of a nation have much to their credit or their shame, then the men who have overlorded the tillable portions of the earth have likewise written heroics or treason on the scroll of the soil; and we find our beginnings to be only their leavings.

Hence when men work close to nature and the unending forces multiplied by unknown causes march on for or against them, we see at once that in this there is no beginning or no ending. The meager contribution we give to progress as we pass by and lay hands on these things may not seem as great today as it will perchance after a few more generations of wise men like ourselves have dabbled in it.

IT is a common observation that conservatism wants to travel in the paths of beginners, while progressivism regards its philosophy as the one of making an end of old, mistaken beginnings.

I have a companion who is a progressive. He is now beset with the idea of beginning an agrarian revolution of some intangible kind—but, mind you, an entirely economic one. His utterances to his constituents are full of the fire of a paladin of old; his clarion calls of contention and volleys of impatience ranging themselves against the follies of tradition, usage, custom, and all such beginners' nonsense.

Notwithstanding, he is a conservative at heart, though his voice is the voice of the liberal. Why? Because this chap, in his vehement magnifying of our economic horrors, has completely and deliberately ignored the debt mankind owes to science, to improved technic, and to education by precept.

He has encouraged his followers to

(*Turn to Page 62*)

Part of the new Pennsylvania Produce Terminal at Philadelphia.

America's Markets

NUMBER IV: *Philadelphia and Detroit*

By Frank George

U. S. Department of Agriculture

PHILADELPHIA, the third largest agricultural market in the United States, and Detroit, the fourth, comprise the lesser half of the "Great Four" cities—New York, Chicago, Philadelphia, and Detroit—in the million-consumer class. These four cities have a combined population of 12,332,000 persons, or approximately one-tenth the total population of the United States. They draw on practically every state and many foreign countries for their food supply.

Philadelphia, always an important consuming market, has shown steady growth in proportion to increased population the last 10 years, but the increased importance of Detroit to farmers has been truly phenomenal, due largely to the rapid strides made by Detroit as an industrial city. Unloads of potatoes at Philadelphia in 1926 filled 8,156 cars compared with 7,130 carloads in 1920, but unloads of this commodity at Detroit were 4,468 cars against 2,695 cars in 1920.

The distribution picture in both cities has changed markedly in recent years, but especially so in Philadelphia where new terminals have been erected by the Baltimore & Ohio and Pennsylvania railroad. Completion of the Camden Bridge spanning the Delaware River from Philadelphia to New Jersey has affected marketing methods as affording more rapid transportation of produce from the truck areas in New Jersey to the Dock Street and Callow-

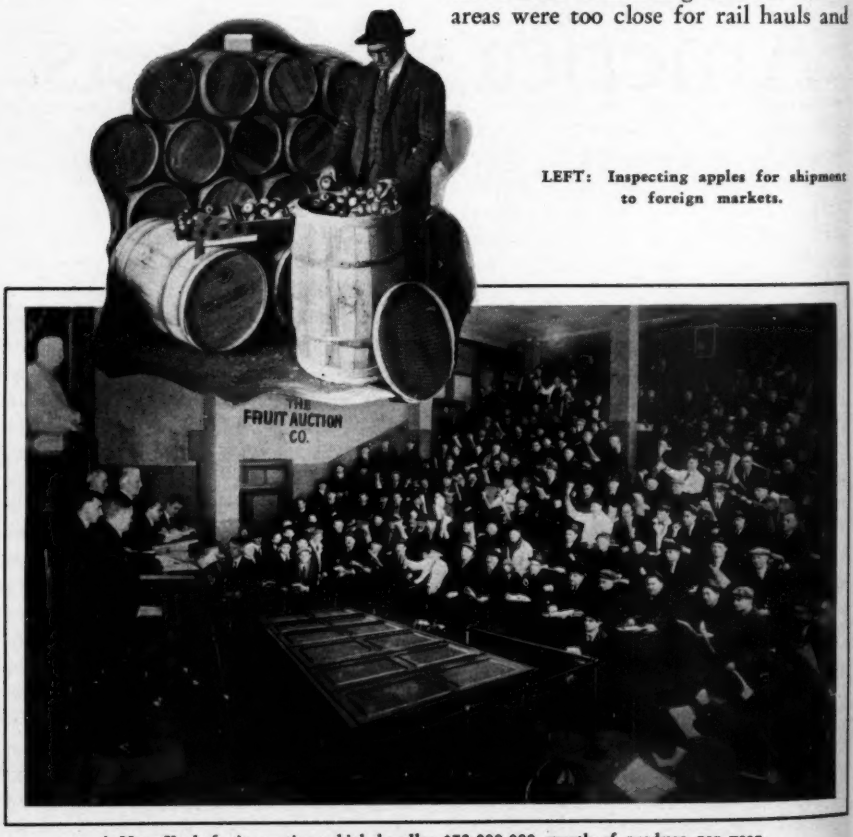
hill Street jobbing markets in Philadelphia. Another project under way is the erection of a cold storage plant by the Pennsylvania Railroad, to have a capacity of 2,000,000 cubic feet of storage space.

Practically all distribution facilities in Philadelphia now are located along the Delaware River on the east side of the city, including wholesale markets, jobbing markets, and fruit and vegetable auctions. Formerly the Pennsylvania Railroad tonnage was received at team tracks and a market house on the Schuylkill River on the west side of the city, the produce being hauled cross-town through an already heavily congested area.

The improvements in the marketing machinery at Philadelphia have greatly relieved much of the traffic congestion which formerly prevailed as a result of cross-city hauling of produce, and the use of ferries by New Jersey truck growers. Competition to place their products on the Dock Street and Callowhill Street jobbing markets, was keen among these growers, long lines of trucks forming before midnight on the Jersey side of the ferries. It is expected that ultimately a new jobbing market will be erected nearer the Philadelphia side of the Camden Bridge which will further facilitate truck hauls.

Motor Truck Hauls

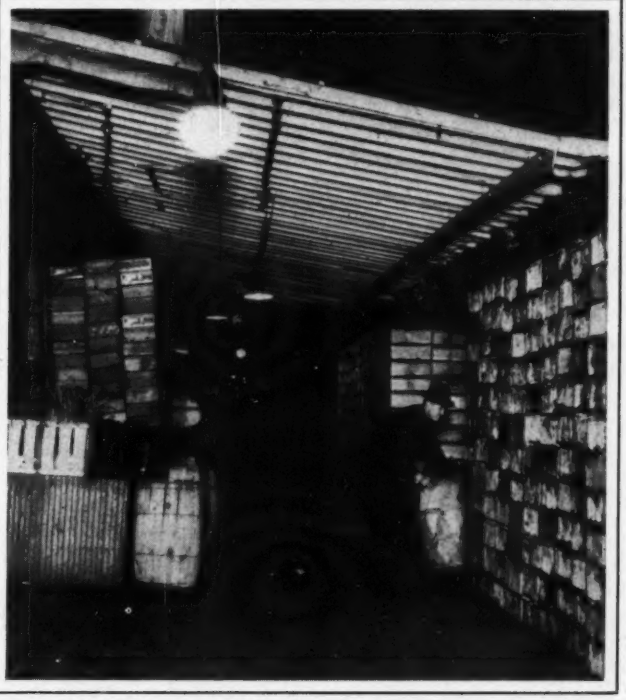
As in other large cities, there has been a large increase in motor truck hauls into both Detroit and Philadelphia from areas whose only limitation in marketing has been their long distance from consuming centers. These areas were too close for rail hauls and



LEFT: Inspecting apples for shipment to foreign markets.

A New York fruit auction which handles $72,000,000 worth of produce per year.

too far away for horse-drawn vehicles. The motor truck has been a boon to these areas which can produce and market efficiently, and has put to their mettle the nearby growers who are feeling the increasingly keen competition. An important feature yet to be worked out in connection with the motor truck is an efficient method of reporting truck arrivals if market gluts are to be prevented.



Midnight in a big city market—preparing for the next day's business.

During the strawberry season of 1925, the growers on the Virginia Peninsula and those of the adjacent section of Maryland established a motor transport to Philadelphia, Camden, and other markets in the general region around Philadelphia. The trucks are loaded at field packing sheds about four p. m. and unloaded on the Philadelphia market between midnight and one a. m. in competition with nearby arrivals. Similar transports have been organized in other areas for hauling cabbage, peaches, sweet potatoes, and other commodities.

Truck Types

The type of truck employed in this method of moving fruits and vegetables depends on the packages used and the commodity carried. Cabbage is generally loaded in bulk, the truck being provided with vertical side and end racks. For peaches and sweet potatoes, which in some sections are packed in hampers, the trucks are provided with vertical side and end racks, and also with horizontal racks on which the packages are placed in an upright position, thus forming layers in the load and protecting the lower layers from the weight of those on top. Generally, all loads are covered with a canvas sheet to protect them from dust and heat.

The refrigerated motor truck has not yet been fully developed although attempts have been made to construct one that may be operated cheaply and effectively. Trucks of this type are insulated boxes with a compartment reserved for ice similar to the bunkers in a refrigerator car. There is one form that depends on the circulation of brine through coils located in the top of the carrying compartment, which, from the standpoint of cooling the load, is successful.

Detroit consumers are served principally from a "main" wholesale market adjacent to unloading tracks, and an "eastern" market which is essen-

tially a jobbing and retail market. Of 20,553 carloads of 16 fruits and vegetables received at Detroit in 1926, California furnished 5,467 cars, Michigan 3,368 cars, Florida 1,899 cars, and Georgia 1,512 cars. The bulk of the potato supply comes from Michigan, but producers in 29 other States contribute to the supply of this commodity. Apples are furnished principally by New York, Washington, and Michigan; grapes from California; onions from Michigan, Indiana, and Texas; and peaches from Georgia and Illinois.

Sold in Job Lots

Much of the produce supply in Detroit is sold in job lots from railroad car doors, for the reason that many of the receivers have no warehouse facilities and depend entirely on the cars as a place of business with the public. Should the demand be slow for a particular product, a car may be tied up a week and sometimes two weeks with consequent loss through deterioration and added distribution expense. During most of the summer months, both the Michigan Central Railroad and the Pere Marquette, which together handle over 90 per cent of the receipts, hold a considerable number of cars in their outer yards for as long as a week until room can be made for them at team tracks.

This situation in Detroit has stimulated greatly the use of the auction as a rapid sales agency, upwards of $5,000,000 of business in fruits and vegetables passing annually through the auction. Although the average net return per car may be somewhat less through the auction, there is a quicker turnover of supplies, prices are on a true basis of supply and demand, market gluts are prevented, and cars are released promptly. Every lot offered can be sold at some price, regardless of quality or condition, as all classes of the quantity-buying trade are represented among the buyers.

The volume of sales through all fruit and vegetable auctions in the United States is estimated at more than $200,000,000 a year. Fifteen years ago the total auction business amounted to $42,000,000. The auction business in Philadelphia was reported at $17,328,371 in 1923, and must now be in excess of $20,000,000 a year. Four years ago the Philadelphia auctions were handling 15,000 carloads of produce a year; the volume now must be more than 20,000 carloads. The low point of auction sales is in January or February when sales are confined largely to domestic citrus fruits, boxed apples and pears, and foreign citrus and dried fruits. Sales steadily increase the next few months, reaching a small peak in June. The peak for the year is in the fall when heavier shipments of citrus and deciduous fruits arrive at market.

Sources of Supply

California, Florida, New York, and Maine lead in importance as sources of the Philadelphia carlot supply. Of 35,383 carloads of 16 fruits and vegetables unloaded at Philadelphia in 1926, California contributed 8,462 cars, Florida 5,181 cars, New York 4,881 cars, and Maine 2,442 cars. Potato supplies come principally from Maine, Pennsylvania, Virginia, South Carolina, and Florida; apples from Washington, New York, Virginia, and Pennsylvania; lettuce from California, Arizona, and New York; onions from New York, Massachusetts, and Texas.

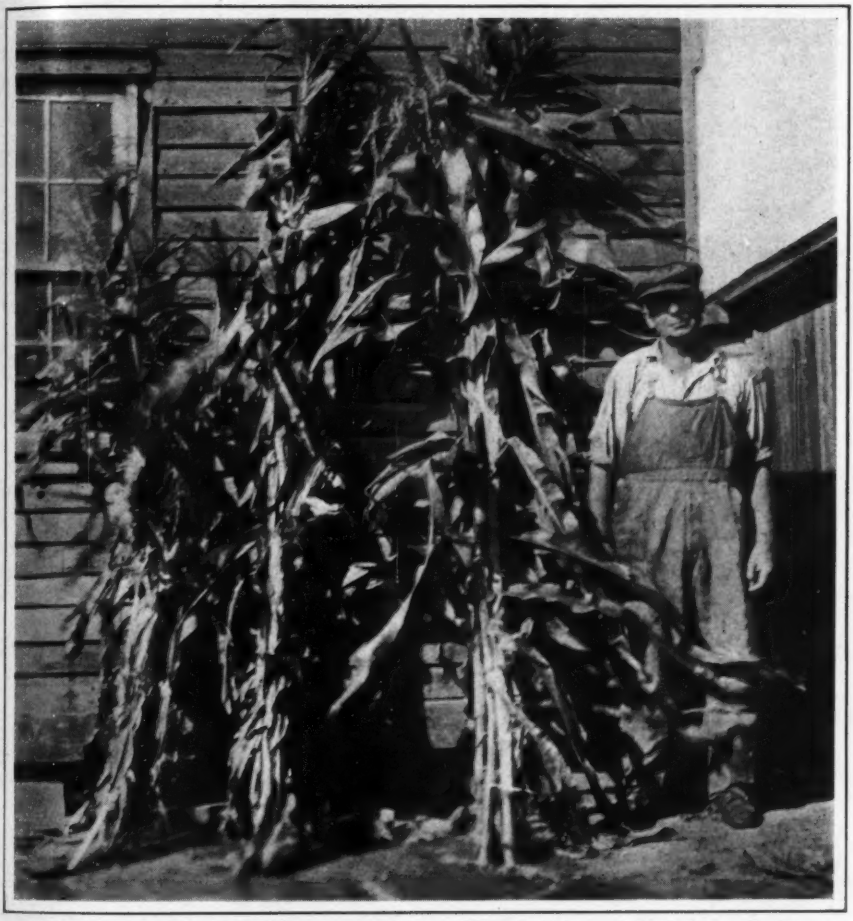
Hundreds of New Jersey farmers truck their crops to the city on a commission basis. Truck is raised near-by in Pennsylvania, but the necessity to reach Philadelphia is not so great inasmuch as the numerous villages and towns afford equally satisfactory markets for retailing and huckstering, and sometimes better markets when the city commission district is glutted.

The Philadelphia jobbing markets present a busy scene of stores and broad sidewalks filled with the ever-present ⅝ bushel baskets, tacked 8 or

(*Turn to Page 57*)

Potash *for* Corn

By *A. A. Hansen*
Purdue University



The small corn plants to the left are representative of the yield on muck land that received no potash, the middle bundle, on land that received a single application of 100 lbs. of potash per acre, while the largest, sturdiest stalks to the right are the product on muck land well supplied with potash. The farmer is Charles Ducke of Crown Point, Indiana, who made the tests.

THAT potash develops sturdy corn plants was demonstrated in a striking manner by Charles Ducke of Crown Point, Indiana, who has been conducting a number of tests on his farm in cooperation with County Agent Lloyd Cutler of Lake county, Indiana.

In the picture to Ducke's right are three bunches of corn-stalks, representative of the growth on three plots of muck land in a field that has been in corn for the past 11 years. The largest stalks came from a plot to which potash at the rate of 125

(*Turn to Page* 54)

Variety test plots after harvesting. Each plot contains two shocks.

KANSAS

Experiment Station

By R. I. Throckmorton

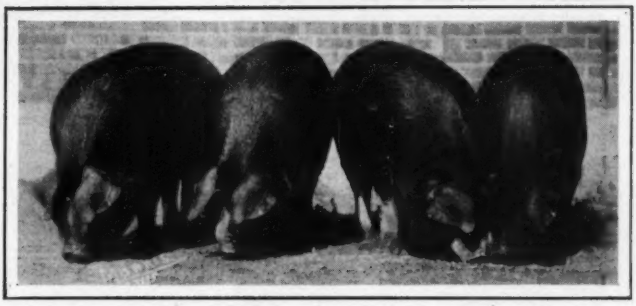
Head, Department of Agronomy

ON the day after the Hatch act had received the signature of the President, the legislature of Kansas, being then in session, passed a resolution. This resolution, dated March 3, 1887, accepted the conditions of the measure and vested the responsibility for carrying out its provisions in the Board of Regents of the Kansas State Agricultural College. Until 1908 the expenses of the Agricultural Experiment Station were provided for entirely by the federal government.

At the present time, in the neighborhood of 100 projects, covering practically all phases of agricultural investigation, are being studied by the members of the Agricultural Experiment Station Staff. In addition to the work at the central station, we are conducting work at four branch stations in the state.

The first of these is the Fort Hays branch station which consists of 3,560 acres of land. The work of this station may be divided into two divisions: (a) experimental projects; (b) general farm and livestock work.

The experimental projects are as follows: Dry-farming investigations; forage-crop investigations; cereal-crop



Prize-winning pigs produced by the Kansas Agricultural College.

investigations; forest, nursery, and park demonstration and investigations; farm dairying; and experiments in the feeding and breeding of livestock. All of this work is confined to the study of the problems peculiar to the western half of the state and relates especially to crop production under limited rainfall, to the development of varieties better adapted to the climatic conditions there prevailing, and to studies of the systems of animal husbandry and dairy husbandry suited to this region. The facilities of this station are being used for the growing of large quantities of pure seed of the strains and varieties which have proved in actual test to be most productive in the western part of the state.

The Garden City branch station is located near Garden City and consists of 320 acres of upland soil. This station is used for the purpose of determining the methods of cultivation, crop varieties, and crop rotations best suited to the southwestern portion of the state under dry-land farming conditions.

Dean L. E. Call,
Kansas State Agricultural College.

Other Branch Stations

The Colby branch station, located near Colby in the northwestern corner of the state, consists of 314 acres and is used for the purpose of determining the best varieties of farm crops and cultural methods in that section of the state.

The Tribune branch station consists of 160 acres and is used primarily to study the problem of producing, storing, and utilizing crops for winter feeding of cattle, which is one of the most important problems in that section of the state.

The agronomy farm at the local station consists of one-half section of land which is used primarily for experimental purposes. The projects which are being followed at this station are as follows:

A. Soil Fertility Investigations: 1. Crop rotation; 2. Commercial fertilizers; 3. Lime; 4. Sulphur; 5. Farm manure; 6. Green manure.

B. Tillage Investigations: 1. A study of the effects of numerous methods of preparing a seedbed for wheat on yield and quality of grain and on moisture, plant food, and

R. I. Throckmorton, head of the department of agronomy.

humus content of the soil; 2. A study of the effects of crop sequence on soil tilth and productivity.

C. Crop Improvement Investigations: 1. Winter wheat breeding; 2. Oat breeding; 3. Barley breeding; 4. Sorghum breeding; 5. Corn breeding.

D. The Effects of Cutting Alfalfa at Four Different Stages of Growth.

E. Pasture Management Investigations: 1. Rotation grazing; 2. Effects of burning; 3. Ecological studies.

F. Crop Production Investigations: 1. Tests of new crops; 2. Crop varietal tests; 3. The furrow method of seeding winter wheat; 4. Cultivation of corn; 5. Time and methods of seeding corn; 6. Time and rate of seeding winter wheat.

G. Cooperative Experiments with Farmers: 1. Crop varietal tests; 2. Fertilizer tests; 3. Wheat seedbed preparation methods; 4. Crop rotations; 5. Corn irrigation tests; 6. Corn disease tests.

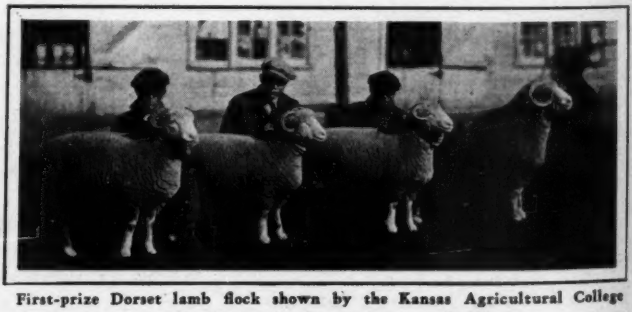
Some of the outstanding results which have been secured are as follows: 1. The development of Kanred wheat; 2. The development of Kanota oats; 3. The development of early sumac sorghum at the Hays branch station; 4. The development of Kansas orange sorghum, which is an important selection made by the station at Manhattan; 5. Pink kafir which was developed by the Hays branch station.

In addition to these improved grains, the station has contributed a large amount of very valuable literature on the subjects of soil moisture conservation, nitrate developments, the preparation of the seedbed for wheat, and methods of cultivating corn.

The Directors of the station since its organization have been as follows:

1889-1891	E. M. Shelton
1891-1900	Station Council
1900-1907	J. T. Willard
1907-1909	C. W. Burkett
1909-1913	Ed. H. Webster
1913-1917	W. M. Jardine
1917-1925	F. D. Farrell
1925-1926	L. E. Call

W. M. Jardine resigned as President of the College in July, 1925, to become Secretary of the United States Department of Agriculture.



First-prize Dorset lamb flock shown by the Kansas Agricultural College at the International and American Royal.

Fruit Tests Show Need of Potash

By R. A. Payne

Northampton, Massachusetts

EDITOR'S NOTE: *The following is a reprint of an article appearing in the New England Homestead, Jan.* 14, 1928. *The information contained in the story was derived from Contribution* 38 *of the Massachusetts Agricultural Experiment Station published in Proceedings of the American Society for Horticultural science,* 1924. *The data for peaches were derived from this source. The data for apples were secured from this same source with three years' additional data given by Dr. J. K. Shaw, Pomologist of the Massachusetts Agricultural Experiment Station.*

FERTILIZER for fruit trees has been reduced to a single plant food—nitrogen. Advice is for fruit growers to use nitrogen alone this year, next year, and for all following years. Briefly, present practice and theory as regards fertilization of fruit trees is that chemical analyses show that the soils of southern New England contain small amounts of nitrogen and phosphorus, and large amounts of potash. Phosphorus apparently is little needed by fruit trees and the large amount of potash in the soil makes the addition of this plant food unnecessary. Nitrogen alone has put many orchards "on their feet." Therefore, present advice is that nitrogen will keep them there. The question is, "Will it?"

There is a small ragged looking little block of young trees at the Massachusetts Experiment Station at Amherst which has a bearing on this question. The block is divided into seven fertilized plots; they have received the same fertilizer treatment each year since 1889. Until 1922, crops were grown on these plots. Then the idea that these plots would give an indication of the fertilizer needs of fruit trees was conceived. Trees, therefore, were set out in 1922. The story the young trees tell through the growth that they have made since 1922 is not what can be expected in one year, but is the result of continuous fertilizer treatments over a long period.

Of the seven fertilized plots in this field, four have received nitrogen alone and in combination with the two other plant foods, four have received phosphorus alone, and in combination, and four have received potash in a like manner. While four plus four plus four make twelve, still there are only seven plots needed to give each plant food alone and in combination with the other two. Try it yourself and see.

One half of each plot was limed. On the unlimed halves of the plots there are no striking differences in tree growth due to fertilizers. The striking differences are seen on the limed sections of the plots. Now if four plots receive nitrogen, four phosphorus, and four potash, as they do,

Nitrogen alone, without lime.

which four plots have the largest trees? One does not need to be an expert on fertilizers to answer that one. Just think of the advice given at the last fruit meeting you attended and put down the answer, "The nitrogen plots." In the class room this answer would be marked "Perfect." These trees, however, gave a different answer. The four plots which gave the greatest tree growth were those receiving potash! It did not seem to make much difference whether the potash was alone or in combination.

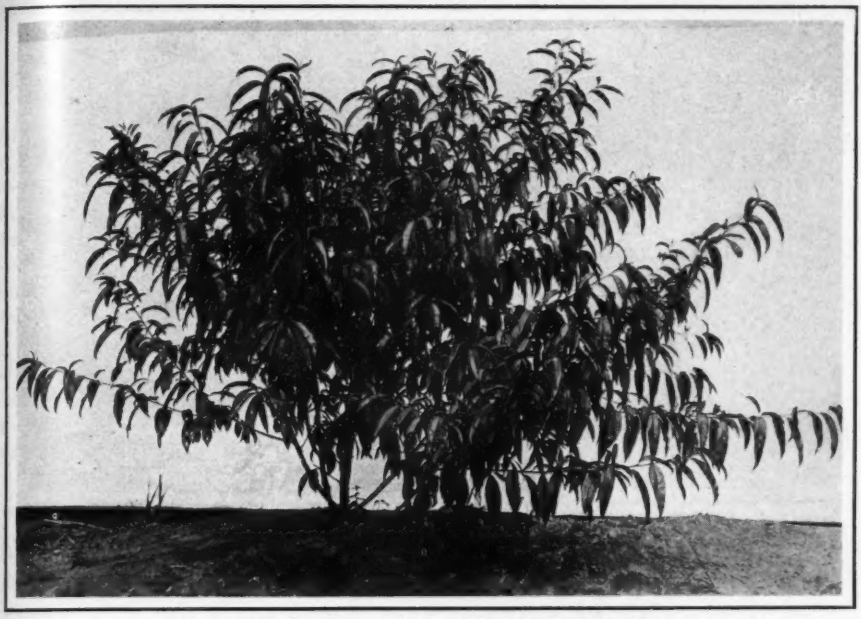
After that, you are probably feeling like the man who saw a giraffe for the first time and said, "There ain't no such animal." They say that figures do not lie, so we will use the figures showing "total average shoot growth per tree" for the different plots. To save space in giving fertilizer applications per acre, we will use the following symbols: L, lime (last application in 1916); N, nitrate of soda, 160 lbs.; P, 320 lbs. superphosphate (acid phosphate); K, 160 lbs. muriate of potash.

Let's have another question: If our soils contain from 17,800 to 45,100 pounds of potash in the surface soil, as careful analyses made at the New Haven Experiment Station show that they do, will the addition of 160 pounds of muriate of potash per acre yearly in addition to nitrogen and phosphorus make any difference in the growth of young peach and apple trees? Those who should know say that it will not, if one is to believe their statements that trees only need nitrogen. Here is the answer that the trees gave at Amherst (average total shoot growth per tree in feet, two years on peach, four years on apple):

Fertilizer	Peach	Apple
L, N, P	65 feet	34 feet
L, N, P, K	206 feet	68 feet
Gain for K	141 feet	34 feet

Here the potash, in addition to nitrogen and phosphorus on the limed

Result of nitrogen-phosphorus-lime.



A complete fertilizer trebled growth of this peach tree.

plots, trebled the growth of the peach trees and doubled that of the apples.

Let's look at the chemical analysis of soils again. The analyses referred to above show that these same soils contain from 502 to 1,760 pounds of phosphorus in the surface soil. These are small amounts when compared with the potash in these same soils. If these are facts, and they are, will the trees respond more to phosphorus than they do to potash? Here is what the trees say at Amherst:

Fertilizer	Peach	Apple
L, P	85 feet	26 feet
L, P, K	286 feet	83 feet
Gain for K	201 feet	57 feet

Here the addition of potash to phosphorus more than trebled the growth both of peach and of apple trees. No one toots a loud horn for phosphorus for fruit trees. Alone it is not effective in producing tree growth. In combination with lime and potash, however, it produced the largest peach and apple trees in this experimental orchard.

The same chemical analyses quoted before give the nitrogen content of these surface soils as from 826 to 4,178 pounds per acre. This is high as compared with the phosphorus supply and low as regards the potash supply. These being the facts, will potash in addition to nitrogen give more tree growth than nitrogen alone? If fruit growers have not been hard of hearing, they can easily answer this one. This is the answer the trees gave:

Fertilizer	Peach	Apple
L, N	101 feet	28 feet
L, N, K	195 feet	55 feet
Gain for K	94 feet	27 feet

Here the addition of potash to nitrogen nearly doubled the growth of both peach and apple trees.

When chemical analysis of soils is considered and when we think of present advice regarding the fertilizing of fruit trees, we might ask a very foolish question: If the trees are getting phosphorus and potash, will the addition of nitrogen increase the growth? And the trees at Amherst

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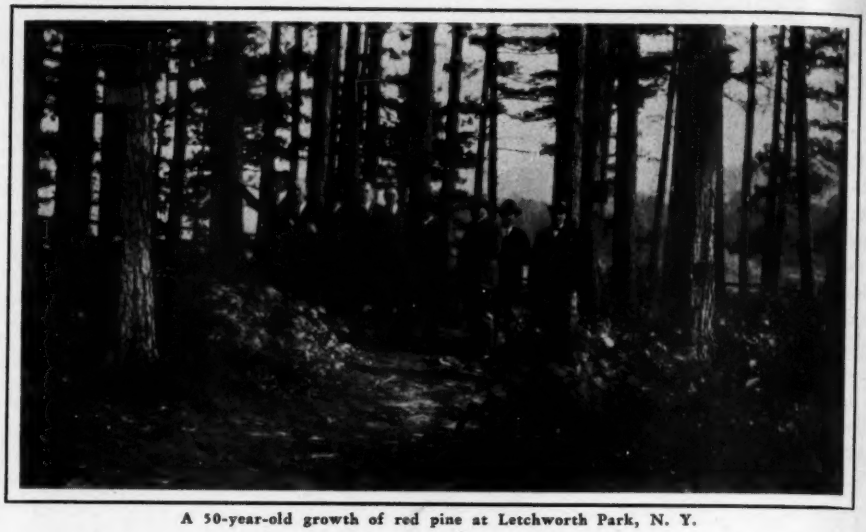

A 50-year-old growth of red pine at Letchworth Park, N. Y.

Abandoned Farms or Forests—WHICH?

By L. H. Woodward

Agricultural Agent, Warsaw, N. Y.

WM. SANBURY, an enterprising banker in western New York, asked me to spend an afternoon with him at his farm. We drove out through the fertile Cassadaga valley north from Jamestown and back into the hills at the village of Gerry.

I knew from past contacts with Mr. Sanbury that he was interested in farming, and that he had an idea that much of the idle land of western New York State profitably could be reforested. Not many miles east of Gerry the hills began to grow steeper, the roads became narrower, and as we continued along our route, there was less and less evidence of traffic, until finally there were only two narrow strips of bare land where a few passing automobiles kept the grass worn off. Suddenly and without warning Mr. Sanbury turned into the yard of what appeared to me to be an empty farmstead, and here was Mr. Sanbury's farm.

It was in August and the hay was still standing. Evidently no crops had been planted and the principal crop that could have been harvested was the crop of native herbs consisting mainly of daisies, paint-brush, sedge, and Canada bluegrass.

The farm buildings were in fairly good condition. There was an old frame house with a vine-covered porch. The woodshed and the back-door showed evidence of former activities. On the floorboards in the woodshed and the threshold of the back-door the knots stood out against

many years of wear as ample signs of the activities that there had once been here.

But why Mr. Sanbury owned such a farm and what he expected to do with it were the questions. As soon as I hinted at the dangers that would lie in wait for a man who attempted to bring back such a farm into crop production, Mr. Sanbury began to laugh. "You see I purchased this farm at the County Tax Sale," he said. Then he told me that this farm, like many other farms in the section, had been sold by the county treasurer because of failure of the owner to pay the taxes.

Taxes Too High

For two or three generations these farms had supported prosperous families; the land had been prosperous when the demand for food was such that men were willing to work two days for a bushel of wheat. Profits on these farms had declined during the early part of this century, when men were paid two bushels of wheat for one day's work. During the war such land had become very unprofitable when four or five bushels of wheat were all that were allowed a man for a day's work.

Further than this taxes on this land had increased manifoldly during the last century. The increase had been slow at first, but had seemed to gather momentum as the years rolled on, and during the past few years had increased most rapidly.

On this particular farm the taxes in 1832, according to the records, had been $2.72, in 1902 taxes had increased to $36.50, and the last year that the farm was occupied the owner had paid $61.20 as his part of the cost of maintaining schools, building roads, and other government expenses. The climax had to come soon after the war. The improved roads had meant little to this farm, and the little school over two miles away meant less, but still they were very important items in the taxes collected from this farm.

These boy scouts transplanted eight acres of forest seedlings in one day.

We went back across the fields now entirely grown up to native crops. Here was a rough field where the last crop harvested had apparently been potatoes. Here had been evidently a field of buckwheat, and the grass had been rather slow to take possession of the land again. The old pasture was pretty well grown up to wild thorn-apple, and in places such trees as aspen, cherry, beech, and basswood were beginning to take their places. Most of the meadow land was free from any tree growth, but much of the pasture was covered, sometimes by species of trees that had some value as lumber, sometimes by such useless species as aspen, thorn-apple, and witch-hazel.

The fences had largely disappeared, although the fence-row was much in evidence. Growth was more luxuriant here, possibly because this land had not been cropped so heavily. The berry bushes in the fence-row were thriftier, and the berries that they bore were larger than those which we found in the pasture and the meadow.

I found that Mr. Sanbury planned to reforest much of this idle land. Some of it he would leave to the native growth, on some of it he planned to transplant varieties of evergreen trees, but eventually he wanted to have all the land covered with forest growth.

Later on I had the pleasure of accompanying Mr. Sanbury on several trips to study reforestation work that had been

done. On one of these trips he took me to a large tract of poor hill land that had been set 40 years before with European larches. These larches apparently had been set very close together, perhaps four feet apart in each direction. In the 40 years these trees had grown to an average of one foot in diameter at the base and stood 55 or 60 feet tall. This tract was entirely neglected. Many thousand valuable fence-posts could have been harvested, for European larches make excellent fence-posts. Many of the trees had blown down, probably from too much crowding. It was such a crop as this that Mr. Sanbury proposed to have on this farm of his.

On another trip, this time to Letchworth Park in western New York, he saw an area of more than 1,000 acres that had been set aside for educational purposes in reforestation. The first of the plantings were about 20 years old. The principal species used here in these earlier plantings were white pine, Scotch pine, black locust, and red oak.

The white pine plantation had been attacked many times during the last 10 years by the white-pine weevil. The superintendent of the park told us that he had tried to keep this weevil under control. Men had been sent through the forests every year to cut out and burn all terminal shoots that had become infested, in spite of this it was impossible to keep the pest under control.

The black locust had made rapid growth, but had been severely damaged by the locust borer. This locust planting had been in such bad condition that the superintendent planned to cut it down and burn it the following winter.

Pines Prove Satisfactory

The Scotch pine had made very rapid growth. The principal faults to be found with Scotch pine were the crooked trunks and the coarse quality of the lumber after it was grown.

With red oak the growth was very slow.

The white pine was the most satisfactory. Forestry men who were with us on this trip assured us that the white pine would overcome the damage caused by the weevil, and would readily develop into excellent quality saw-logs.

Every one present on this trip became enthusiastic over the natural plantations of red pine. Nearly all of these trees were two feet in diameter at the base, and had grown 65 or 70 feet tall in the 50 years.

An eight-year-old planting of red pines averaged from six to eight feet in height. These pines had made a rapid, uniform growth and in the eight years had practically covered the ground. Red pines appeared to be free from attack of insects and diseases.

A shallow furrow turned by the tractor facilitates the transplanting of trees.

Now these are the crops that Mr. Sanbury had in mind for his abandoned farms. He is interested in the planting of South Carolina poplar for pulpwood, European larch for fence-posts and telephone poles, Norway spruce for Christmas trees and lumber, the

red pines for lumber.

As a banker Mr. Sanbury was interested in this reforestation from two standpoints. Jamestown is one of the largest lumber consuming cities in this country, and there would be no question about a favorable market for any sort of lumber that could be produced. Then too, idle land is not an asset to any community and even though profits on reforested land are greatly delayed, yet future generations could reap the reward.

An 8-year-old growth of red pine plantings.

Mr. Sanbury feels that a great change is needed in our forest policies and our taxation policies in the eastern part of the United States. First of all he feels that something should be done to make taxes more representative of the earning power of a farm. When that is done, farmers themselves will become interested in growing forests on their poorer land.

Growing forests is a practical, not a sentimental task. For a man to put his money and his land to this work, there must be a fair amount of profit in it. Our ideal, then, must include a plan of levying taxes on land growing forests that will encourage this sort of work for the benefit of future generations.

Interested Citizens

In Chautauqua county and in many other counties of central and western New York, there are many acres of land that can be bought at reasonable prices. Much of this land is suitable only for reforestation. On nearly every farm there are acres that once grew forests and can best grow them again. Mr. Sanbury's ideal would be to have the state and every subdivision of it, each with its own forest and every farmer with his own woodlot. In a word, an ideal picture of our future forests would show all the land that should be growing forests doing that work. Such a picture is not difficult to paint and could be brought about if all citizens were as interested in forestry as is Mr. Sanbury.

Now to go back again to this abandoned farm area and consider its future. A little over a century ago this land was covered with tall and valuable trees. There must be trees for tomorrow and for many other generations to come. This thin hill-land is best fitted to produce trees. It can perform this task well if it is given the opportunity. At present these unproductive farms are nothing but liabilities on the tax rolls. They are too expensive to cultivate. There should be some form of tax adjustment that will encourage the use of the land for long-time investment with a low rate of income.

If these things come, and they will come just as surely as the abandonment of these farms has come, then we shall, some of us, live to see this

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Business in Farming

By Guy A. Peterson

Madison, Wisconsin

MATH RASMUSSEN of Somers, Wisconsin, is putting business principles into farming. He watches his crops from the time they are seeded until they change hands on the wholesale markets of the country. He not only grows them, but he also stores a large part of them in his own warehouses when market conditions warrant. So large have the farm holdings grown under his keen eye and skillful care that he sends his stuff to almost every state east of the Rocky Mountains.

More than 200 commission men in various parts of the country have come to know him through his activities along the line of shipping because he annually sends out around 1,200 carloads of potatoes, cabbages, and onions. Some of this produce is purchased from his neighbors, but a high percentage is grown directly under his supervision, because in addition to operating 800 acres of his own land he manages two comparatively large farms for others.

Rasmussen is conceded to be the largest cabbage grower in Wisconsin. Moreover, he is one of the largest users of commercial fertilizers in the state. That the practice of good farming is

ABOVE: This field of cabbage on Math Rasmussen's farm was fertilized with 1,000 lbs. per acre of an 0-14-14 fertilizer.

LEFT: W. C. Pallesel, who has worked for Math Rasmussen for many years, is shown here cultivating potatoes fertilized with 800 lbs. per acre of an 0-14-14 analysis.

ABOVE: Math Rasmussen standing waist deep in a field of wheat as level as a ballroom floor.

RIGHT: One of the three sets of buildings and part of the herd of 500 fat Herefords on the Rasmussen farms.

He does believe that the efficient farmer who keeps his land in good shape is soon due for a period of higher prices, that will enable him to make financial returns from farming which will be satisfactorily comparable with the returns that are secured from other lines of business.

It was my pleasure last summer to ride with this business farmer over the four farms that he has made into very paying him well is indicated by the fact that he has never failed to make a profit on his year's operations. He has risen in the financial scale from a penniless immigrant, who landed at Somers 34 years ago at the age of 16, to a prosperous landowner, who today is worth well up into the six figures. He drives an automobile as he directs the various activities on the four farms that he has been able to buy and pay for from the proceeds of his business. He looks forward to even brighter days in the agricultural future, for as he says, "With thousands of people moving away from the farms as they have been doing the last few years, it looks as though there will be something in it for some of the good farmers who stay on the land."

Rasmussen does not believe that any serious food shortage will be experienced for a long time to come. itable gardens. We rode through his fields on gravel roads that he himself built at a cost of several thousand dollars. These roads enable him to load his trucks directly from the field, where the soil is soft and springy in wet weather in spite of the fact that he has laid a net work of tile drains under all of his land.

Whichever way we looked on his farm, we saw the crops uniform in size and the land free from weeds. Many of the farms around his, however, were overgrown with weeds, while the crops were spotted and sickly looking. Rasmussen told me that this spotted effect was due largely to the fact that the spring of 1927 was wet and cold and many of his neighbors could not get out on their land early because they had not tiled it. He said the bad conditions due to the wet spring were further

augmented by the fact that many farmers in his community had sold their horses and bought tractors with the expectation of doing most of their work without hired labor. As a result they had to work their land with soil packing tractors before it could dry out.

Although Rasmussen uses tractors for plowing, harvesting, and threshing, he is a friend of the horse and has 36 beautiful big draft animals on his farm. He finds that it pays him to do much of the work with horses, and he believes that there are many farmers who would be better off today if they had never bought a tractor.

A Modern Farmer

He attributes his own success in farming largely to the fact that his land is efficiently drained, treated with heavy applications of fertilizer, handled with expert care with proper tools, planted with selected seeds, and run with good management made possible by loyal and efficient helpers. Some of his men have been with him for more than 20 years, and they swear by him because he treats them as equals and isn't afraid to get out and work with his own hands.

One of the important factors in Rasmussen's successful farm management is his rotation system. He follows a five-year cycle that enables him to harvest big crops with a minimum of danger from diseases and insects. Largely because of this he has been able to grow the old strains of cabbage with little loss from the dreaded Yellows disease that came so near wiping out the cabbage industry in Wisconsin at one time. Even here, however, he uses the disease-resistant varieties on some pieces of land.

In general his rotation is hay, potatoes, cabbage, corn ½, beets ½, and wheat seeded down to clover. There are some variations in this as market conditions affect in some manner the exact acreage of any crop and as 45 acres of onions are grown, but on most of the farm the five-year rotation holds good.

Each Rotation Fertilized

Every acre on the place gets at least a ton of commercial fertilizer once each rotation, in addition to some 25 or 30 tons of barnyard or stockyard manure. He buys between two and three hundred tons of fertilizer every year in addition to many carloads of manure from the stockyards. He declares that he never saw a year yet when he didn't make money farming, so this heavy fertilizing practice is proving to be profitable with him even though he does admit that he has not yet discovered the exact amount of fertilizer that will yield him the largest number of profit dollars in return.

Now that he has built up his soil, however, he intends to treat his farm as a manufacturing plant and apply as many pounds of plant food per acre as are removed by the crops during the rotation. He expects to be able to materially reduce his purchases of stockyard manure in the future because he feeds about 500 head of baby beeves and several hundred hogs a year and all their manure is utilized.

One of his four farms was once the famous Schlitz farm where beer profits made it possible to maintain a large stable of racing horses. The huge barn had an eighth of a mile track under cover where the blueblooded horses were exercised. Now this track is covered with concrete, and the barn is filled with young Herefords. All the wheat straw grown on the place is used for bedding on a concrete floor, so that practically all of the fertilizer constituents in the feeds are retained and can be hauled onto the fields.

Last year Rasmussen's 800 acres of cultivated land were in the following crops: 180 acre of potatoes, 155 cab-

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Verified Seed Origin

By C. B. Sherman

U. S. Department of Agriculture

FARMERS are the producers and the primary sellers of field seed, yet they are also the ultimate consumers. Improvement in the seed industry, therefore, aids the farmer both going and coming. So, too, it aids, either directly or indirectly all the intermediaries through which these seeds pass between production and final planting, for it is rarely that the farmer seed-producers sell direct to the farmers who later plant this seed. Moreover, better seed means better crops, so improvement in the one means improvement in the other. Considering these double-barreled facts, it is evident that all improvement in the seed crop and its marketing methods must have widespread effect.

W. A. Wheeler, Chief Marketing Specialist, in charge of Hay, Feed, and Seed Division, Bureau of Agricultural Economics, U. S. D. A.

G. C. Edler, Bureau of Agricultural Economics, who conducts the seed marketing and seed reporting work of U. S. D. A.

Many of the leaders in the trade have deplored the fact that, until recently, the seed business has been so largely speculative. As one of the first steps in putting the seed business on a more satisfactory foundation, the Wholesale Grass Seed Dealers' Association went on record, a few years ago, as favoring the studies of the Department of Agriculture on the cost of marketing seeds and on cost accounting records, and offered to cooperate with the Department in this work.

The most recent event in this improvement program is the inauguration of a seed verification service by the Bureau of Agricultural Economics. This service has been in operation since last October and is the out-

growth of recommendations made at seed marketing conferences held in 1926, in Chicago, to devise and suggest means by which verification of origin may be accomplished. The tentative plan for a seed verification service, developed at these conferences, was later approved by the International Crop Improvement Association and Wholesale Grass Seed Dealers' Association (now Farm Seed Association of North America), with the recommendation that the details be worked out by the Bureau.

Details Worked Out

Last June, at the regular meetings of the Farm Seed Association of North America and the American Seed Trade Association, the details of the proposed service were presented for discussion. A number of seedsmen made informal request that the service be established that year and that they be permitted to issue verified-origin seed certificates under the proposed plan.

All dealers who enrolled in this service, known as verified-origin seed dealers, agree to keep prescribed stock records and samples which, together with their stocks, are subject to the inspection of the Bureau of Agricultural Economics. These dealers are required to make applications for inspection certificates covering all lots which are to be verified, to submit weekly reports covering new lots of verified-origin seed prepared or offered for sale, and to comply with the rules and regulations of the Service. Sixty-three dealers in 24 States, well distributed, have enrolled for the first season, which ends on June 30, 1928.

Verification during the first season is limited to alfalfa, clovers, and seed corn. It probably will be extended gradually to cover other field seeds. The Seed Verification Service is purely voluntary. There are no penalties other than the withdrawal of privileges, and the possibility of refusing any further benefits or use of this Service. The seed inspectors are located in Washington, D. C., Chicago, Minneapolis, Kansas City, Salt Lake City, and San Francisco.

The starting point in the evidence supporting the statement of origin is the grower's or shipper's declaration or an official state certificate of origin. The shipper, when filling in a shipper's declaration, declares that the lots described therein have been obtained directly from growers with proper declaration or other sufficient evidence as to locality of production; that the facts stated therein are correct to the best of his knowledge and belief; and that the locality of production and identity of each lot are properly covered by his records, which will be made accessible for verification by a Federal seed inspector at any time upon request. These records will show what disposition is made of every pound of the kinds of seed which are being verified.

To Obtain Certificates

With declarations at hand covering the various lots of seed for which verification is desired, the verified-origin dealer makes application to the nearest inspector for an inspection certificate, giving the kind of seed, name of shipper and shipping point, or declaration number covering the shipment, date of shipment, shipper's lot number or mark, the verified-origin dealer's receiving lot number, the quantity in pounds, place where the seed was grown, and kind of declaration covering the shipment. This certificate entitles the verified-origin dealer to issue verified-origin seed certificates for all lots covered by it. Reasonable fees which approximately cover the cost of the service are charged.

The verified-origin seed certificate, the recognized commercial document verifying the origin and identity of the seed which it covers, may be used as a tag certificate attached to a bag

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Know Your Soil Type

By William Battle Cobb

Professor of Soils, North Carolina State College

IN his recent book, Soil and Civilization, Dr. Milton Whitney, former Chief of the United States Bureau of Soils, has compared a soil type with a factory designed for the manufacture of a definite product or group of products, and the farmer who manages a soil type with the specialist who superintends the work in a particular kind of factory.

This comparison is a most excellent one. It is impossible to produce cotton goods in a furniture factory. Cotton goods may be produced in a woolen mill, but only with a very low degree of efficiency.

It is also impossible to produce bright tobacco on a poorly-drained, black, acid soil type. This special crop can be produced on a dark colored, upland, sandy loam soil, but not with the same efficiency nor of the same quality that is possible on the lighter colored sandy loam to which it is especially adapted. Likewise, a rice farmer would not attempt to grow rice on a well-drained upland soil with porous subsoil, but selects instead a poorly-drained flat soil with compact subsoil.

These are extreme cases, but it is obviously true that different cropping systems and different methods of farming will be most efficient on different soil types.

A study of the influence of soil types on crops, on animals, and even on man and his progress discloses some interesting facts. The fertile Houston clay soils of Texas with their high yields of cotton and forage crops are directly responsible for the industrial development of such cities as Dallas, Waco, Austin, San Antonio, and Sherman and have had an important influence on the progress of other Texas cities.

The Hagerstown soils of the Ken-

ABOVE: Corn on Norfolk sandy loam deficient in organic matter and improperly fertilized.

BELOW: This corn, just across a narrow road from the corn pictured at the left, resulted from proper fertilizing and green manuring practices.

tucky bluegrass region and of the limestone valleys of Virginia, Maryland, and Pennsylvania have made of these sections garden spots, and have produced forage and feed of such quality and quantity as to make them preeminent in the production of fine cattle and horses.

The Carrington and Marshall soils of the corn belt have contributed largely towards the tremendous growth and industrial development of Chicago.

Prosperous People

In fact, wherever there are fertile soil types you find a prosperous and progressive people.

It is not necessary for the soil types to have been originally fertile if they have been made fertile by proper systems of cultivation, the growing of the right crops and crop varieties, and the use of correct amounts and kinds of fertilizers. The Norfolk sandy loam of the Coastal Plain is naturally a poor soil, and where the soil has been allowed to remain unproductive, you will find communities of poor churches and inadequate schools, communities which are way behind in the procession of progress. In many localities, on the other hand, where the farmers have studied their soil type and have learned how to make it a fertile and productive soil by proper methods of handling and by using the right fertilizers, there are communities which are as progressive as you will find anywhere.

There are very few soil types which cannot be made into fertile soils, but it is first necessary to know these types, to know their adaptations, their limitations, and their needs. This is necessary on the part of the farmer who manages the soil and also on the part of the agricultural specialist who advises the farmer.

Undoubtedly the great majority of the state and federal agricultural workers have had courses in soils and have read numerous bulletins and articles dealing with soils and soil fertility. But college text books of necessity deal with the properties of soils in general rather than with specific information about soil types. As a consequence the graduates of our agricultural colleges are frequently well-grounded in generalizations about soils, and in general and regional fertilizer practice, but have rather vague ideas about the characteristics of individual soil types, their crop adaptation, and nutrient needs. (*Turn to Page 55*)

ABOVE: Tobacco on Dunbar fine sandy loam fertilized with 1,000 lbs. per acre of 8-3-5. Yield, 1,680 lbs. per acre. Sold for $528.32 per acre.

BELOW: Cotton on Norfolk sandy loam fertilized with acid phosphate and kainit. Nitrogen was supplied by turning under crimson clover.

Carlile P. Winslow, Director, U. S. Forest Product Laboratory.

He Urges Better Preservation and Utilization of Our Woods

IN a modest, two-story, red brick building, constructed on a site made famous for its Civil War days, work is now being done which, some day, may prove invaluable to this country and nation. For as America faces an increasing shortage of timber, the experiments of the staff of the United States Forest Products Laboratory, Madison, Wisconsin, should become more and more important.

It was foresighted statesmanship which lead to the establishment, in 1910, of an institution planned specifically to help this country more adequately meet an impending timber shortage. It was the first institution of its kind ever established and, naturally enough, has become the envy of many other countries.

Foresters, and others familiar with

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The Apple Flea-Weevil

By H. E. McCartney

Fairmount, Indiana

GLENN SONNER of Delaware, Ohio, has found a way of controlling a very serious pest in his orchard. This pest, the apple flea-weevil, is known to many orchardists in various parts of the country and especially in the Mississippi valley. It gained a foothold in Sonner's big orchard eight or ten years ago and did considerable damage.

For a time the pest baffled all efforts at destruction. It was because of a peculiar body construction that this insect seemed able to defy all ordinary methods of control. The usual insect enemies of the apple secure their food by biting. They can be controlled by spraying the foliage and the fruit with a poisonous material. The apple flea-weevil secures food by sucking. It has a long bill or proboscis which it thrusts past the poison into the center of the leaf where it sucks all the food it wants. It is proof against the usual plan of spraying. A hard shell over its body protects it against all contact sprays.

The apple flea-weevil does its damage principally to the foliage. Its eggs are deposited within the layers of the leaf. The young larvae hatch in that protection and feed there until ready to drop to the ground and go through the next stage of development. If left undisturbed and allowed to multiply, this pest would likely become so numerous that the foliage would be entirely destroyed and the trees killed.

Sonner was one of the first men to wage warfare against the apple flea-weevil. Early in the fight he called for the assistance of orchard specialists from the Ohio Experiment Station. They tried the poison spray and they tried contact sprays, but only failure followed their efforts. They even tried burning the rubbish and surface soil underneath the trees. In the effort to destroy by this means, a machine that threw out a heavy, low flame from an oil burner was used. The rubbish in the orchard and the grass roots near the surface of the soil were completely burned or charred. However, this treatment did not destroy the pest, and as seasons followed, the hard-shelled weevils were just as numerous as ever.

Finally, the idea developed that the hope for control lay in thorough cultivation. It was plain that the insects hibernated in the ground. It appeared possible that constant stirring of the soil, thus exposing the shells to the sunshine and the drying, freezing and thawing, might be successful in killing them.

Sonner's first task was to plow up the old sod under the trees. This was done very carefully and thoroughly. The grass in the spaces near the trees was killed by using hoes and other hand implements. In order to get the plow close to the trees, he purchased a small but strong team of mules. After a little training, these mules learned to duck their heads and go underneath the branches of any of the trees.

As soon as the plowing was finished, the disk was started, and all the loosened soil was stirred again. When this was completed, the soil was given another disking. This disking with an occasional harrowing was kept up throughout each season. Especially

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April Showers

LEFT: Youth, April, and beautiful flowers make a happy combination.

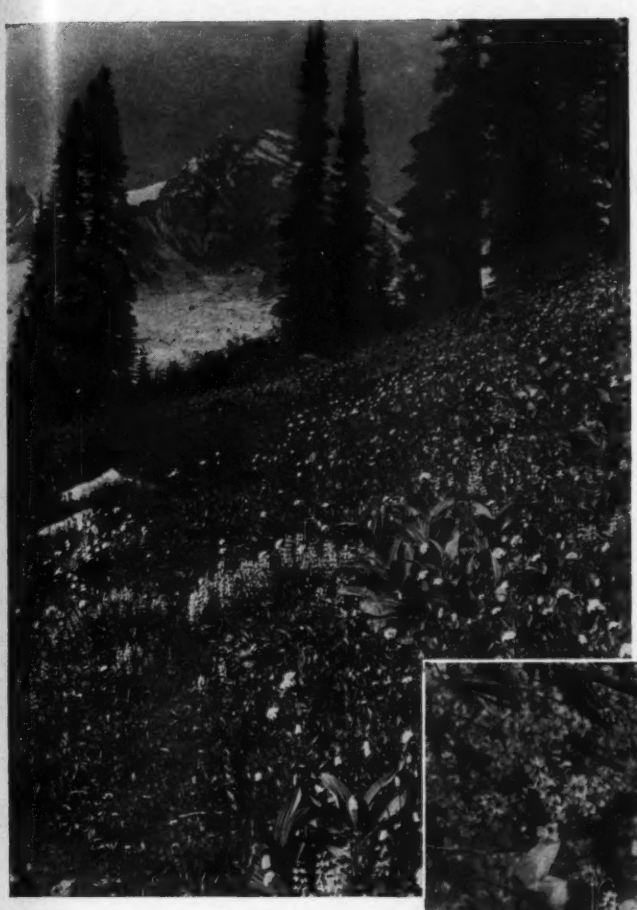
RIGHT: There is no need to be timid with a protector like this. A good dog is not only man's best friend, but a child's trusted playfellow.

RIGHT: Wayne Couch, the three-year-old son of Mr. and Mrs. Cecil Couch, Gaston, Ind., holding one of his father's purebred Duroc pigs.

LEFT: A happy pair. Frances, the little daughter of Professor and Mrs. O. G. Lloyd, West Lafayette, Ind., and her Collie pup.

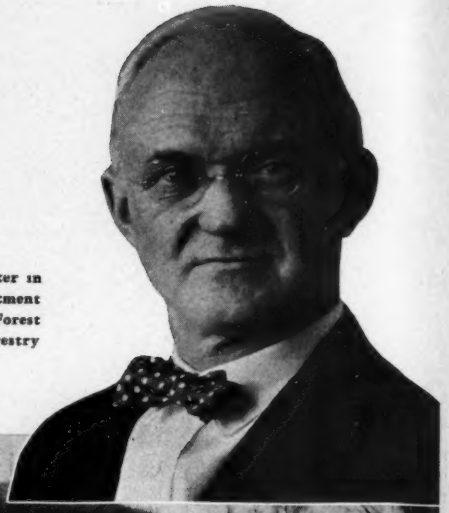
Drilling in commercial fertilizer. Broadcasting by means of an implement of this kind is almost necessary where large amounts of a concentrated fertilizer is to be applied and there is danger of injury to the young plant by the fertilizer coming in too close contact to the seedlings. Hill or drill row applications supply the special needs of certain crops.

A string of mules ready for work in an Iowa corn field. The popularity of the mule for farm work continues in the South and Midwest. Under the pressure of heavy weights, the mule is less impatient than the horse, while a mule's skin is harder and less sensitive to sun and rain.



ABOVE: Springtime in the West. The flowers on this Washington mountainside are all the more beautiful and appealing because of the bleak, snow-covered peak of Mt. Ranier in the background.

RIGHT: An invitation to a young man's fancy. Miss Helen Rochet is enjoying some of the first peach blooms in the San Fernando valley, California.



RIGHT: Major R. Y. Stuart, now assistant forester in the Forest Service of the United States Department of Agriculture, who will become Chief of the Forest Service, May 1. He has had a wide range of forestry experience and education.

ABOVE: This group in West Virginia planted 4,500 trees. More than 100 leading citizens of the community participated, including the Boy Scouts and 4-H Club members. Howard M. Gore, Governor of West Virginia, was a member of this party.

LEFT: Colonel W. B. Greely, for many years chief of the Forest Service of the United States Department of Agriculture and connected with the Department's forestry work for 23 years, has resigned, effective May 1, to take a position with the West Coast Lumber Manufacturers' Association.

The Editors Talk

Agricultural Production Power

In 1855 it took three hours and three minutes of labor to produce a bushel of wheat. Now it takes less than ten minutes. Then it took three hours and four minutes to produce a bushel of corn. Now it takes forty minutes or less.

This difference is far greater than can be accounted for by the increase in acre yields, therefore, it must be largely due to the introduction of labor-saving machinery. In other words, there has been a large increase in the output per man. This is a notable achievement.

But there is another field of opportunity for the display of efficiency and economy which has barely been touched and that is in the increase of the acre yield. In fact, full efficiency on the farm will not be attained until maximum returns per man and per acre are attained.

The soil fertility of this country has been greatly reduced, and the restoration of productivity is the most important problem of American agriculture today.

Knowledge is constructive power only where power is needed and applied. Horse power, water power, gas power, electric power have multiplied the ability of man to produce, harvest, and market crops. But chemical power is yet to be used in proper proportion to these other forms. None offers the farmer greater possibilities.

This is a chemical age such as the world has never known. Chemical knowledge is being translated into power by which innumerable desirable ends are being attained.

The manipulation of the different chemical elements to form a plant food ration is one of the greatest contributions of chemistry to human welfare, for whatever produces two units of food or clothing where one has been produced on an acre of oil is indeed a rich gift to the human race.

The soil and climate lack only the aid of well-balanced plant food to double crop yields and do even better. The soluble plant food that chemists have compounded, according to formulae that agronomists have prescribed to meet soil and crop requirements, are making for larger yields per acre and for greater economy of production.

The genius of chemists, mining engineers, and agronomists has placed at the disposal of the farmer quick active plant food, well suited to crop needs and highly renumerative. It is a privilege, as well as an obligation, of all who are interested in the welfare of agriculture to urge the farmer to make use of the kind and quantity of plant food that will give him the largest profits.

The Price of Beef

It is reported in the press that the prices of beef to consumers are high. There is, therefore, a more or less organized tendency to stop buying beef. The local middleman is blamed for charging too much. Whether there is any justification for blaming him or not, there also are other causes which have tended to raise the prices of beef to city buyers.

From 1920 to 1927 beef cattle prices were very low. The result was the failure of many cattlemen and large sales of breeding stock. The cattle population on hand in January, 1928, was less than at any time in the last 25 years.

Naturally, this shortage is being felt, and beef cattle prices have increased. When prices of cattle are high, farmers expand their breeding operations as rapidly as possible, but it takes three years to raise a two-year-old steer. Consumers have to wait, therefore, until there are more cattle to supply the demand to reduce prices. Usually in a period of high beef prices, many proposals are made as to how to increase this beef supply, but this is the wrong time for the public to take an interest. An interest should be given at the time when cattle producers are going bankrupt.

The practical application of this rise in beef prices is that it shows that agriculture and the farmer cannot be left out. The city man may never know the farmer, but yet the farmer has a mighty influence on city prosperity. Agriculture adjusts itself to economic conditions as surely as any other industry. But due to the time it takes to produce cattle and crops, the adjustments are often slower but, nevertheless, sure. Just because such adjustments are slow, the vital influence of agriculture is often overlooked.

No one, least of all the city man who wants cheap beef, can afford to forget the farmer.

Salesmen of Knowledge

What is the county agent or the teacher of vocational agriculture, if he is not a salesman of knowledge? A tribute to his importance to our national progress was recently expressed by Glenn Frank, president of the University of Wisconsin. So well does Mr. Frank place these salesmen as one of the most necessary factors in effecting a sound future for America, that we quote him herewith:

"We shall never lack for the administrator, the third man needed to complete the trinity of social servants, and we have an ample supply of investigators, but there is a shortage of readable and responsible interpreters, men who can effectively play mediator between specialist and layman. The practical value of every social or material discovery depends upon its being adequately interpreted to the masses. Science owes its effective ministry as much to the interpretative mind as to the creative mind. The knowledge of mankind is advanced by the investigator, but the investigator is not always the

best interpreter of his discoveries. Rarely, in fact, do the genius for exploration and the genius for exposition meet in the same mind. A dozen fields of thought are today congested with knowledge that the physical and social sciences have unearthed, and the whole tone and temper of American life can be lifted by putting this knowledge into general circulation. But where are the interpreters, with the training and the willingness to think their way through this knowledge and translate it into the knowledge of the street? I raise the recruiting trumpet for the interpreters."

Our Forests

April 22-28 has been designated as American Forest Week. In his proclamation setting aside this week for the observation of this growing national problem, President Coolidge urges thoughtful cooperation from all citizens. The preservation and wise use of our forests, to the end that energetic forest policies will be adopted in all communities, is the concern of every citizen, he believes. We heartily agree.

Public education is essential to the conservation of our forests. While the economic importance of wood is clearly defined in the minds of a great many, there are vast hordes of people who have never thought of the necessity of conservation and reforestation. An added appeal may be made to the unthinking in the fact that forests protect the fertility of our farm lands, keep our streams pure, protect fish and game life, and give us beauty, inspiration, and healthful recreation.

The first American Forest Week was proclaimed in 1921 by President Harding. Three years ago Canada began to observe its "Save the Forests Week" at the same time, so that the movement has assumed an international scope. National organizations are cooperating and local Forest Week committees are being organized in every state.

Inexperienced Farmers

In Middlesex county, England, a photographer quit his job and started farming. He specialized in pigs and poultry. In open competition he won first prize for his pigs.

The ex-photographer is of interest as one of a small army of people who have taken up agricultural pursuits in Great Britain since the war. Their farms are small; from 1 to 50 acres. They are provided under the "Small Holdings and Allotments Act." Such holdings have been provided by every county in England and Wales in order to meet the needs of suitable applicants. The total area of land so occupied is 440,000 acres.

In addition to the ex-photographer, many others who have had no agricultural experience previous to the war have been eminently successful in winning prizes in open competition. For instance, in the county of Surrey, the winner of the Clean Milk competition was a tenant who had no farming experience

prior to the war. Another new farmer won a first prize open to all farmers irrespective of area.

The record would indicate that when properly selected and supervised and given a fair opportunity, many people who have had little or no previous experience can operate successfully a small acreage of land.

In America, how many times 440,000 acres of land are not being used to advantage? If we develop mass production in industry with its shorter hours, undoubtedly some of this unused land will be tilled by men working part of the time in factories. This will be true particularly of factory units located in the smaller towns. Such a scheme would produce results not in crops alone, but in better health and a greater degree of social stability.

Looking into the future, it is very comforting to know that whether we have had experience or not, it is quite probable that we could successfully manage a small area of land, even though we could not perhaps take any first prizes.

"I Now Introduce"

Every agricultural agent, extension man or vocational teacher—in fact, every man in a leader relationship to agriculture—is frequently called upon to introduce public speakers.

I have introduced many, and by the same token, I have been introduced by many; and my ideas on this subject are colored both by my mistakes as an introducer and my chagrin at some introductions I have had.

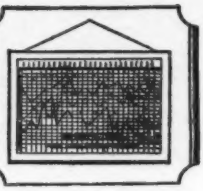
An introduction has two main purposes: 1—It should create a favorable state of mind and bespeak a sympathetic ear on the part of the audience toward the speaker personally; and 2—It should state in as few words as possible the background of training and experience from which the speaker derives the authority for what he may have to say.

Of all platform nuisances, the worst is the fellow who thinks he must introduce every speaker with some joke or story. Occasionally there is one that is quite apropos, but most of them have a very far-fetched point; by far too many have none at all. I have observed that these introductory stories are very unsafe.

Between those loquacious fellows who spread it on too thick by giving the main speech of the evening and those who force the speaker to introduce himself because they have merely stated, "I now introduce J. G. Hays who will speak to you on Holstein horses," there is a very safe and unpretentious middle-ground aptly illustrated by an introduction I recently heard which ran like this, as near as I recall it:

Folks: It is truly a pleasure for me to present to you at this time, my friend Professor Joe Cox. Professor Cox has been making a very careful study of alfalfa for more than fifteen years. Many of the 600,000 acres of alfalfa now growing in the State of Michigan bear silent testimony tonight to the thoroughness of his work and his estimate of the crop. His subject is Alfalfa for Feed and Seed."

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

PEAT POSSIBILITIES

Because there are 7,000,000 acres of peat land within its boundaries, Minnesota, beginning 10 years ago, has established four peat experimental fields and as a result has greatly increased the area of such lands under cultivation. These lands, where the water table can be lowered sufficiently, have been made to produce as good yields of tame grasses and clovers as the best loams or clay loams. Hardy vegetables like carrots, cabbage, and turnips that can withstand summer frosts have done well on peat. Winter rye, oats, and barley gave good yields, and high yields of potatoes of excellent quality have been grown when summer frosts did not interfere. Since 1919, in Anoka county, where one of the first peat stations was established, and where no farmers were cultivating peat land, there are now about 700 farmers growing crops on peat. Most of these peat soils need both phosphate and potash, some need only phosphate and a few need only potash. Lime is needed on some of this land.

END RESULTS

For seed purposes one end of a potato is probably just as good as the other, says William Stuart of the U. S. Department of Agriculture, after reviewing extensive experimental results and after carrying on some tests of his own. For a long time many growers have been convinced that the seed end is undesirable for seed; others have been just as strongly convinced that the stem end should be discarded. He says it is doubtful if there is any real superiority of one end over the other, although as the weight of the set increases there seems to be a greater response from the seed-end than from the stem-end set. In the Department's tests "greening" or sprouting seed potatoes in the light before planting has shown conflicting results.

NEW WAY TO STUDY SOIL BACTERIA

Following a method for studying bacteria in milk directly under the microscope, devised by Dr. R. S. Breed of the New York State Agricultural Experiment Station, it has been found possible to adapt this direct method to the study of soil bacteria. Dr. H. J. Conn, soil bacteriologist of the same station, says it is possible by this method to learn quicker than by any other means "whether an organism inoculated into a soil is capable of growing there. This makes it possible to learn what a particular kind of bacteria needs to live in the soil, and from this can be inferred whether it is harmful, beneficial, or of no particular use." The method is now being tried in Europe. Dr. Conn's opinion is that it will lead to the solution of some very practical soil problems.

CABBAGE DOES DOUBLE DUTY

The poultry department of the West Virginia College of Agriculture has worked out a plan for getting more out of cabbage than was formerly thought to be in it. From the

middle to the last of August, when egg production has been on the downgrade, and on into the fall, the outer leaves of cabbage were taken off to supply green stuff for the flock, and results have shown that egg production was well maintained. At the same time, the removal of the leaves at this period of growth did not seem to injure the keeping quality of the cabbage. In fact, those who carried on this experiment said the keeping quality seemed to be improved. The stripped heads were stored on racks in the cellar and not under ground. The outside leaves are much richer in vitamins than the inside ones and, therefore, the hens get the best of it.

LIGHT SEED—LIGHT YIELDS

Cotton growers are advised by P. H. Kime, plant breeder of the North Carolina State College of Agriculture, to pay more attention to the weight of the seed used. Because the weight of the seed is so important, he recommends thorough cleaning and grading. Light cottonseed has been shown to have a much lower germinability, and even when plants are produced they lack vitality and many of them cannot carry on. The principal cause for low yield for light seed is the lack of a good stand. Cotton plants will adjust themselves somewhat to a poor stand, but it is impossible for the plants that are left to make up for their lower number when there are wide gaps.

LEAFHOPPERS CAUSE ALFALFA "YELLOWS"

Another count has been registered against the insects in the war of scientists to protect our crops. Prof. A. A. Granovsky of the University of Wisconsin, talking recently before the American Association of Economic Entomologists, said that the common potato leafhopper is responsible for the serious disease of alfalfa known as "yellows." He believes the insects introduce a virulent poison into the plant tissues. According to his investigations, the hoppers produce bad effects on many other legumes, including clover, soybeans, and garden beans.

ACID SOILS BAD FOR SEEDS

Many times when crop failures are attributed to poor seed or lack of plant food, the real cause is acid soil, says Professor A. W. Blair, soil chemist at the New Jersey Experiment Station. This investigator says seeds of such crops as spinach, carrots, beets, lettuce, celery, and cabbage are adversely affected by strongly acid soil. Even when these seeds germinate in such soils, the plants often die before maturity. Professor Blair asks the vegetable growers to consider the methods employed by tobacco growers who in preparing seed beds for plants first burn logs, brush, and similar materials on the ground to add lime and potash to the soil. He says that of course this method cannot be applied to whole fields, but it suggests that lime and fertilizer may be used to bring about proper conditions.

HOT RADISHES

Delay is what makes the radish "hot," says B. L. Weaver of the Illinois College of Agriculture. The delay in this case is delay in planting so that the radish cannot grow through the cool season which is most favorable for this ordinarily crisp and cool vegetable.

RETRIBUTION

One of the Government predatory animal hunters in the Arizona district set out to get a wolf that had come over from Mexico and was causing trouble for stockmen. This marauder came upon a fox caught in one of the traps, killed the fox, and then trotted on into a trap himself. Hunters say it is very unusual for an animal to kill another held in a trap.

Foreign and International Agriculture

New Zealand Pastures

EDITOR'S NOTE: *Last month we devoted this section to information on the control of weeds in German meadows by proper fertilization. This month we want to continue the discussion by telling something of grassland management in New Zealand. The following is taken from an article which appeared in the June 1 issue of the New Zealand Farmer Stock and Station Journal.*

IN New Zealand, pasture management has long been considered of vital importance to the progress of the Dominion. Recently, a survey of the benefits of top-dressing, both in regard to tests made under the supervision of the Department of Agriculture and by individual farmers, has been made.

New Zealand suffered a reduction in exports from 55 million pounds in 1925, a record year, to 45 millions in 1926. At the same time, the expenses in production did not fall; consequently, lower income has prevailed.

One means of meeting lower prices is to produce greater quantities at less cost. Since 94 per cent of the exports from New Zealand are pastoral products and these are largely dependent on grasslands, the importance of pastures to the New Zealand farmer is readily appreciated.

The question which vitally interests all citizens of the country is the increasing of the carrying capacity of pasture lands, which total about 33 million acres. Of this total, only a very small percentage is carrying its maximum total of stock per unit area.

Top-dressing with commercial fertilizer has been proven by far the most important means to increasing this carrying capacity of grasslands. One prominent agricultural authority goes so far as to say that in top-dressing, to make two blades of grass grow where one grew before, lies the future of New Zealand's pastoral industry.

That the farmers are sensing the situation is seen in the fact that whereas only five or six years ago it was a rare occurrence to find a farmer who had top-dressed, today the percentage of top-dressers in any district is high. Hundreds of instances could be quoted embracing farmers all over New Zealand who have markedly increased their production through top-dressing.

Official Experiments

The Department of Agriculture is carrying out extensive experiments along this line and has already secured splendid results.

A. W. Hudson of the Department of Agriculture, in estimating the increased return from top-dressing, says, "It must be borne in mind that the increases in weight of hay do not represent the full benefit derived from a treatment. The effect on the nutritive value of a pasture must be considerable. Further, where only one crop of hay is weighed in a season, it

seems reasonable to suppose that this crop taken after the maximum growing period of from 12 to 16 weeks represents not more than half the total growth for the year. Hence any increased result during the greater part of the year would be clear profit in addition to any already sown."

More Potash Used

While many farmers so far have only resorted to the use of superphosphate, the rise in the use of potash, in addition to superphosphate, during the past year has been very noticeable. Because phosphates are most needed in New Zealand soils, the effect of potash has not been sufficiently appreciated, but results are showing that farmers should try out this class of manure on their grasslands, especially where a good application of phosphate has been made over a series of years. It has been recommended that at least 100 lbs. of 30 per cent potash should be tried per acre, and 200 lbs. per acre seems to be the right quantity to use in many parts of the country in conjunction with phosphates. The effects of potash on pastures is noticeable in the increased growth of clovers and in the better color given to pastures. Feeding value of the pasture is increased, this being evidenced from the extra return in milk production on dairy farms and the increase of wool and mutton on sheep lands.

Stock graze potash-treated areas before others. This point, as well as some of the others mentioned, was brought out in some tests carried out by A. M. Weir, a well-known Ayrshire breeder. Mr. Weir stated that he had experimented with top-dressing in a small way for years without benefit; then with one of his neighbors he figured out a top-dressing experiment with various manures. The result proved conclusively that potash was the manure for his pasture. All of Mr. Weir's plots which were treated with potash weighed out heaviest. Nine weeks after cutting, the potash plots were still in the lead and showed a bigger difference than before they were cut.

On a 20-acre paddock where Mr. Weir used potash and lime, he was quite certain that the carrying capacity was more than double. A strip which got no potash came up principally brown-top, and there was more ragwort on it. When Mr. Weir had finished his top-dressing, he dressed with 100 pounds of a 30 per cent potash to the acre a chain-wide strip across the ends of four paddocks which had been top-dressed with superphosphate and lime. The lime could be followed unmistakably. The dairy cows showed a great preference for these strips, and there were 15 times as many clover heads as on the rest of the paddock. On Mr. Weir's trials 200 pounds of 30 per cent potash per acre proved a most profitable dressing. Mr. Weir's neighbor also received his highest returns from 200 pounds of 30 per cent potash application.

Another farmer who omitted potash in top-dressing a two-year-old grass paddock stated that the paddock carried only one-fourth of the stock carried by paddocks on which potash was included in the fertilization. When his cows were put on the potash pasture the milk yield went up three cans a day, and it came down again when they came off.

Several sheep farmers, who used a potash top-dressing mixture, stated that they got their lambs away quicker and secured more weight of wool from the sheep grazed on the treated pasture.

Mr. Neil Ross found that top-dressing with superphosphate and potash quickly eliminates moss from pastures and that he got as much milk from 50 cows as he did prior to top-dressing from 68 cows, and on 40 acres less area on the farm.

Mr. Clark brought back practically a bare paddock by top-dressing with superphosphate and potash.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

"State Laboratory Fertilizer Report, Seed Report, July-Dec., 1927," State Board of Agriculture, Dover, Del., Vol. 17, 2.

"Ammoniates for Cotton Fertilizers," Georgia State College of Agriculture, Athens, Ga., Jan. 10, 1928, A. E. Gibson.

"Analyses of Commercial Fertilizers," Agr. Exp. Sta., Lexington, Ky., Bul. 276, Dec., 1926, H. E. Curtis, H. R. Allen, and Lelab Gault.

"Inspection of Commercial Fertilizers," Agr. Exp. Sta., Amherst, Mass., Control Series, Bul. 41, Dec., 1927, H. D. Haskins, L. S. Walker, and M. W. Goodwin.

"Inspection of Agricultural Lime Products," Agr. Exp. Sta., Amherst, Mass., Control Series, Bul. 42, Dec., 1927, H. D. Haskins, M. W. Goodwin, and J. W. Kuzmeski.

"Composition and Prices of Commercial Fertilizers in New York in 1927," Agr. Exp. Sta., Geneva, N. Y., Bul. 548, Dec., 1927, L. L. Van Slyke.

"Fertilizer Report, 1926," Pa. D. of A., Harrisburg, Pa., Vol. 10, No. 8, Apr. 15, 1927, (Gen. Bul. 444) James W. Kellogg.

"Cotton Fertilizer Experiments," Agr. Exp. Sta., Clemson College, S. C., Bul. 245, Feb., 1928, T. S. Buie and J. D. Warner.

"Fertilizers for West Tennessee," Agr. Exp. Sta., Knoxville, Tenn., Cir. No. 20, Feb., 1928, C. A. Mooers.

"Tabulated Analyses of Commercial Fertilizers," Tenn. D. of A., Jan. 1, 1928.

"Commercial Fertilizers in 1926-27 and Their Use," Agr. Exp. Sta., College Station, Texas, Bul. 368, Oct., 1927, G. S. Fraps and S. E. Asbury.

Crops

A most compact treatise on the growing of onions is found in Extension Leaflet 118 put out by the Massachusetts Agricultural College. Gerald J. Stout of the Department of Vegetable Gardening has treated in a direct manner and with few words the problems which confront the onion grower and their possible solution.

An interesting report of the Michigan Muck Farmers' Association includes papers presented at the annual conventions at the Michigan State College during the past three years. These experiences of muck growers and findings of soil and other specialists will have an appeal to all muck farmers.

A little Oklahoma Circular, No. 64, "Why Alfalfa Fails," written in the form of a letter by F. M. Rolfs, Plant Pathologist, is easy to read and instructive. Alfalfa has spread in popularity over so many sections of the country that anything put out on the culture of this legume is welcome.

Oklahoma Bulletin No. 171, "Outfield Experimental Results, McIntosh County," bears testimony to the fact that acid phosphate, the complete fertilizers, and manure pushed the cotton crop along and a higher yield of cotton was produced than from the other fertilizers under boll weevil conditions. The influence of the complete fertilizers has been more or less consistent in that they have been among the highest each year.

Another testimonial for the use of complete fertilizers is found in the "Thirty-Eighth Annual Report of the Board of Trustees" of the Clemson, S. C., Agricultural College. For five years, fertilizer experiments with Irish potatoes have been conducted at Clemson College, Florence, and Summerville. It appears from the results obtained that Irish potatoes respond to heavier applications of potash than

it has been the custom to apply, and that the best results are secured from not less than one ton per acre of a complete fertilizer.

"Monthly Bulletin of the Department of Agriculture," State of California, Sacramento, Cal., Vol. XVII, No. 1, Jan., 1928.

"Annual Report of Cooperative Extension Work in Marion County, Indiana, Jan. 1 to Dec. 31, 1927," Purdue University Agr. Ext. Dept., Lafayette, Ind.

"Seed Treatment for Corn Diseases," Agr. Exp. Sta., Ames, Iowa, Cir. 108, Jan., 1928, I. E. Melhus, C. S. Reddy, W. P. Raleigh, and L. C. Burnett.

"A Systematic Study of Squashes and Pumpkins," Agr. Exp. Sta., Ames, Iowa, Bul. 244, Nov., 1927, E. F. Castetter and A. T. Erwin.

"Annual Report for Fiscal Year Ending June 30, 1927," Agr. Exp. Sta., Ames, Iowa.

"Fifty-Seventh Annual Report of the Secretary of the State Horticultural Society of Michigan for the Year 1927," Lansing, Mich.

"Precautions for Feeding Spoiled Sweet Clover Hay," Agr. Exp. Sta., Fargo, N. D., Cir. 35, Feb., 1928, L. M. Roderick and A. F. Schalk.

"Outfield Experimental Results, McClain County," Agr. Exp. Sta., Stillwater, Okla., Bul. 170, Jan., 1928, H. C. Potts.

"Cotton Variety Experiments," Agr. Exp. Sta., Clemson, S. C., Bul. 244, Feb., 1928.

"Annual Report of the Director," Agr. Exp. Sta., Brookings, S. D.

"The Spacing of Cotton," Agr. Exp. Sta., Knoxville, Tenn., Cir. No. 19, Feb., 1928, C. A. Mooers.

"Two Farm Gardens," Agr. Ext. Service, Knoxville, Tenn., Pub. 145, Jan., 1928, W. C. Pelton.

"Tomatoes in the Farm Garden," Agr. Exp. Sta., Knoxville, Tenn., Pub. 148, Feb., 1927, W. C. Pelton.

"Growing and Marketing Texas Vegetables," Texas Dept. of Agr., Austin, Tex., No. 88, Aug., 1927, L. A. Seymour and J. Austen Hunter.

"The Effect of Salt Water on Rice," Agr. Exp. Sta., College Station, Tex., Bul. 371, Dec., 1927, G. S. Fraps.

American Potato Journal, Washington, D. C., Vol. V, No. 2, Feb., 1928.

"A Five Year Program for the Development of Agriculture in Grayson Co., Va.," A. & M. College, Blacksburg, Va.

"The Bindweed," Agr. Exp. Sta., Pullman, Wash., Pop. Bul. 137, June, 1927, E. G. Schafer.

"A Wiser Use of Wisconsin Land," Agr. Exp. Sta., Madison, Wis., Cir. 219, Jan., 1928, H. L. Russell and K. L. Hatch.

"Forward Steps in Farm Science," Agr. Exp. Sta., Madison, Wis., Bul., 396, Dec., 1927.

Economics

There are about 69,000 agricultural associations in the United States. About 58,000 are business associations, associations which the farmer has set up to assist him in handling his business transactions. They include cooperative marketing associations, collective purchasing associations, mutual insurance companies, and associations which furnish telephone service, electric current, transportation, etc. Technical Bulletin No. 40, published in January, 1928, by the United States Department of Agriculture, "Agricultural Cooperative Associations—Marketing and Purchasing 1925," by R. H. Elsworth is a study of the cooperative marketing and purchasing associations. Since governmental aid for cooperative marketing has been suggested as one of the means of solving the present agricultural difficulties, it is interesting to have these data on the growth and scope of agricultural cooperatives.

During the agricultural depression, farm taxes have been especially burdensome. As taxes have increased, a heavy burden has fallen on owners of real estate. Bulletin No. 223, "The Farm Tax Problem in Arkansas," published in February, 1928, by the Arkansas Agricultural Experiment Station, is C. O. Brannen's study of the situation in Arkansas.

A relatively small amount of the average production of Kansas wheat is forced on the market because of shortage of storage space. Studies of the effect of credit on time of marketing indicate that about 10 per cent of the Kansas wheat crop is "forced" onto the market because of the farmer's inability to get the desired bank credit. "The Effects of Shortage of Farm Storage Space and Inability to Get Local Bank Credit on the Movement of Kansas Wheat to Market," is the title of Bulletin 244, written by R. M. Green of the Kansas State Agricultural College, Manhattan, Kansas.

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Pages From A Field Note Book

Arkansas Cotton

By Earl Kilpatrick

Marianna, Arkansas

H. M. SPILLMAN, Paragould, Ark., found that a heavy application of an 8-4-6 fertilizer paid when used under cotton in 1927. This land was prepared for cantaloupes in the spring, and fertilizer was put down at the rate of 500 pounds to the acre under the rows. Floods destroyed the cantaloupe stand, and the land was planted to cotton. Every other row came where the row of cantaloupes had been. This of course made one set of rows fertilized at the rate of 1,000 pounds per acre and the other with none. The alternate rows were picked separately. Weights are as follows:

Date of picking	Fertilized weights of seed cotton per acre	Unfertilized weights of seed cotton per acre
Oct. 3	526	77
Oct. 20	550	330
Nov. 17	605	237
Total	1,681	644

Increase due to fertilizer 1,037 pounds per acre.

Value at 7 cents per pound $72.59.

Cost of Fertilizer $35.00.

Net profit $37.59.

An important fact is that the early pickings on the fertilized rows were relatively high. It is essential to have cotton open ready for picking as early as possible. Earliness insures higher yields, facilitates getting the crop out of the field, and enables the farmer to have better grades.

Nitrogen alone does not give best returns on worn eastern Arkansas soils. A well-balanced fertilizer can be used with profit.

P. M. Martin ran a test with cotton during the year of 1927 under the direction of County Agent E. S. Barrentine and the agronomy department of the University of Arkansas. This test was run on rather thin clay loam soil that has been in cotton many years and is fairly typical of much of the old land in the eastern part of the state.

Application	Weight seed cotton per acre
No treatment	1,090
100 lbs. nitrate soda (acre)	1,340
250 superphosphate	1,160
100 nitrate soda	
250 lbs. superphosphate	1,170
(Same as 400 lbs. 10-4-0 per acre)	
400 lbs. 10-4-4	1,330
600 lbs. 10-4-4	1,490
400 lbs. 10-4-4	
100 lbs. nitrate soda, side	1,560
No treatment	920

It will be noted that the plot that had 400 pounds of a 10-4-4 produced 160 pounds more seed cotton per acre than the adjoining plot that received 400 pounds of a 10-4-0. The difference in the treatment is equivalent to the potash that is 32 pounds of muriate of potash. Thirty-two pounds of muriate costs about 80 cents re-

tail. Increasing the rate of application of 400 pounds of 10-4-4 to 600 pounds of 10-4-4 to the acre increased the seed cotton another 160 pounds, or nearly a pound of seed cotton for each pound of fertilizer used.

A Profitable Crop

By Earl Kilpatrick

Marianna, Arkansas

J. W. SOWELL, Faulkner county, Arkansas, made a net profit of $614.40 on five acres of cotton in 1927. This is as much labor income as the average farmer makes on an entire farm. The methods he used can be used by every farmer who will follow the directions of his county agent. In growing his crop Sowell had the direction and the cooperation of County Agent, W. L. Hall, Conway, Ark.

The history of this five acres is interesting, because it demonstrates again that high yields and large profits go hand in hand.

The soil is a sandy loam type and was in cotton in 1924, '25, and '26. The land was broke flat in April. Planting was done May 5, and 700 lbs. per acre of a *10-4-4 fertilizer was applied by hand at the time of planting. Acala planting seed of an approved strain was used.

Summary of costs and returns:

3,500 lbs. of commercial fertilizer	$47.50
Land preparation	10.00
Planting	5.00
Seed, 6 bushels	12.00
Cultivation	17.00
Chopping and hoeing	12.50
Picking	106.00
Total cost	$210.00
Yields—	
Total seed cotton	9,681 lbs.
Total lint cotton	3,527 "
Total seed	6,800 "
Returns—	
3,527 lbs. lint at 20 cents per lb.	$705.00
6,800 lbs. seed at $35 per ton	119.00
Total receipts	$824.00
Total cost	210.00
Labor income	614.00

*Phosphoric acid, nitrogen, and potash.

A Comparison

By G. R. Cobb

Salisbury, Maryland

A comparison of low and high potash fertilizer on corn was made by L. J. Powell, Parsonsburg, Md., last year. Mr. Powell used 400 pounds per acre of 3-8-5 fertilizer on one plot, and a similar amount of 2-8-10 on another plot, the cost of fertilizer in each case being the same. The soil was peat, not very well drained.

The yield on plot No. 1 with the 3-8-5 fertilizer was 46 bushels per acre; plot No. 2, 2-8-10 fertilizer, yielded 63 bushels per acre. Placing a value of $1.00 per bushel on the corn, the difference in favor of the fertilizer containing the larger percentage of potash was $17.00 per acre.

Good Management

By W. L. Myers

Richmond, Virginia

AN outstanding example of up-to-the-minute farm management is that of Reuben Rolph at Sparta in the southeastern section of Caroline county, Virginia. His farm is located on a sandy to heavy loam soil. He believes thoroughly in manure, commercial fertilizers, lime, livestock, and legumes as necessary parts of most any farm enterprise that is going to be a permanent proposition—and most of all he believes in doing a job well and at the proper time.

Several years ago Rolph decided to become a certified seed grower, in this way to increase his revenue, rather than to depend upon his tobacco crops to carry the burden, although he still grows from five to ten acres of tobacco every year. Last year he had 20 acres of soybeans, of the Virginia variety, which were grown for certified seed and on which he used 400 pounds per acre of an 0-12-10 fertilizer. This treatment gave him approximately 30 bushels per acre of beans which won second prize for brown beans at the International Livestock and Grain Show at Chicago and first prize in the certified soybean class at the Virginia State Corn and Grain Show at Farmville in January, 1928. He also won a second prize at the latter show for uncertified brown beans. This 30-bushel per acre yield was at least 10 bushels ahead of the average yield for the county, which is quite a center for certified seed production, owing largely to the fine work of the vocational teacher of agriculture, F. B. Cale, who is also vice-president of the Virginia Crop Improvement Association.

On wheat and rye, also grown for certified seed, Rolph used 400 pounds of an 0-12-8 fertilizer on 13 acres of wheat and 15 acres of rye. For tobacco he uses 800 to 900 pounds of 5-8-5 fertilizer per acre. About 20 Herefords are kept and the manure from them used to good advantage.

Better Shape and Color

By G. R. Cobb

Salisbury, Maryland

A demonstration of the use of potash on sweet potatoes carried out last year by C. C. Hastings, a farmer at Salisbury, Md., proves the value of this plant food element in producing better shaped and better colored potatoes, and potatoes which will keep better in storage. The soil on which Mr. Hastings laid out his plot was a sassafras loam, and he planted the big stem Jersey variety of sweet potatoes.

On Plot No. 1 he applied 1,800 pounds of 3-8-5 per acre.

On Plot No. 2 he made the same application and, in addition, put on 200 pounds of muriate of potash with a lime spreader after the plants were set and had taken root.

Plot No. 1 yielded 250 bushels which returned him $312.50

Plot No. 2 yielded 273 bushels which returned him $341.25

A difference of $28.75

as well as the better shaped, better colored, and better keeping potatoes—due to the 200 pounds of muriate of potash.

More Bushels

By J. M. Graham

Batavia, New York

AN increase of 209 bushels of potatoes per acre from the use of a ton of a 4-10-6 fertilizer is reported by the Wilson farms, certified seed growers, at Gainesville, Wyoming county, N. Y.

In 1926 Mr. Wilson reports the following yields on a Volusia soil:

500 lbs. per A.-3-9-5 . 231 bu. per A.
1,000 lbs. per A.-3-9-5 . 292 bu. per A.

Increase ..... 61 bu. per A.

On potatoes following potatoes in 1927, Mr. Wilson increased his fertilization, having used neither a cover crop or manure, with the following results:

No fertilizer ..... 97 bu.per A.
Plants 11″ apart
1,000 lbs. per A.-4-10-6 194 bu.per A.
Plants 11″ apart
2,000 lbs. per A.-4-10-6 306 bu.per A.
Plants 9″ apart

The use of a ton of fertilizer plus closer spacing gave an increase of 209 bu. per acre. Mr. Wilson said that he did not feel that maximum fertilization had been reached, since the first 1,000 pounds of fertilizer gave only 97 bu. increase per acre while the second 1,000 pounds gave 112 bu. increase.

The no-fertilizer plot was obtained where the fertilizer attachment on the planter failed to work.

Better Methods

By E. H. Hodder

State School of Agriculture, Cobleskill, N. Y.

THE New York State School of Agriculture located at Cobleskill, New York, believes in practising as well as teaching the use of certified seed; proper seed bed preparation; treatment of seed; using the proper amount of the right analysis of fertilizer; proper time of sowing or planting; care during growing period such as cultivation and spraying, or dusting, and harvesting at the right time.

Perhaps some farmers do not think it practical to use all of the above methods. Some of these methods might be easier or cheaper to practise, but unless all are used the large yield of low cost of production per unit or bushel cannot be expected. As a result of using all, we enjoyed a yield of 429 bushels of potatoes to the acre in the fall of 1927.

The potato field had been planted to ensilage corn in 1926. The land was fall plowed and received 20 loads of manure during the winter. Spring fitting of the land was started early and continued until the first of June. In addition to the manure, 1,500 lbs. of 4-10-8 fertilizer was applied with the lime sower and disced in. The rows were furrowed out with a plow and 33 bushels of Certified No. 9 variety of potatoes were planted by hand on June 6 and 7. This variety belongs to the Rural group of potatoes.

The potatoes were cut to weigh between two and three ounces to the piece and dropped every 18 inches

apart in the row. The rows were placed 36 inches apart. This rate of planting was about 30 bu. to the acre. The field received cultivations when it was necessary, and the plants were hilled up during some of the cultivations. The potato plants were dusted three times by using hand dusters and once during the last part of the summer by the power duster. The dust used was a mixture of Bordeaux and arsenate. The proportion of arsenate was decreased during the summer so that the last dust consisted entirely of Bordeaux.

Our students dug the potatoes on October 12 and 14. The potato digger was drawn by a tractor. The total yield of 449 bu. was dug from 1.05 acre, which gave a yield of 429 bu. per acre.

The Apple Flea-weevil

(*From Page* 30)

after a heavy rain, particular pains were taken to cultivate and not to allow the soil to become packed.

Headway has been gained in controlling the weevil. Sonner and the men from Wooster who have cooperated with him closely are encouraged by the results secured. The flea-weevils have not been entirely driven from the orchard, but they have been greatly reduced in numbers, the damage has been reduced to a minimum, and its spread has been prevented.

Sonner is especially active in his cultivation during April and early May, because it is at this time that the weevils are coming out of their winter quarters and beginning to lay their eggs on the young leaves. He is confident that he has this pest under control and that eventually he will be able to practically eliminate it from his orchard. He will keep up his thorough cultivation until this is accomplished. He is of the opinion that the thorough cultivation he has been compelled to practice has increased production in his orchard to such an extent that he has been well repaid for the cultivation.

North Dakota Potatoes

By J. E. McDowell

North Dakota Agricultural College

IN the Red River valley of Walsh county, N. D., a number of farmers have been making interesting trials with commercial fertilizer for their potato fields. This work has been carried on in cooperation with their county agent and the state agricultural college of North Dakota.

Seed used by the farmers in these trials was procured from the Pure Seed laboratory at the college and had been certified previous to being sent out. Several fertilizer analyses were used. In one trial, Rydder strain Triumphs were planted on 8½ acres of land and yielded 353 bushels to the acre. The same farmer planted Sharples strain Triumphs on 6½ acres and received an average of 293 bushels per acre. In both instances he had fertilized his fields with acid phosphate, which he broadcast at the rate

of about 200 pounds an acre. The cost of fertilizing one acre of land with acid phosphate was estimated to be $4.00.

Another farmer in this same section of the state obtained a yield of 238 bushels of Prince Edward Island Cobblers from a field on which he had used commercial fertilizer. This yield was curtailed somewhat by drouth at a critical time in the growth of the potatoes.

But it was considered advisable that fertilizers other than acid phosphate be experimented with. Therefore in the same county, experiments were carried on with the 2-16-2, 4-8-4 and 2-12-12 analyses of nitrogen, phosphorus, and potassium. These analyses also were found to be profitable. Four carloads of commercial fertilizer were shipped into the county last spring.

It is interesting to note that in the state of North Dakota the average yield of potatoes per acre for 1927 was 102 bushels per acre, according to statistics up to Nov. 1. The entire state is estimated to have produced 11½ million bushels of potatoes during the year, while in 1926 there were 7½ million bushels produced.

He Urges Preservation

(*From Page 29*)

the present forestry situation in America, appreciate that "it is already too late to assure the generation of 50 years hence an adequate supply of wood, even on the basis of intensive reforestation started now." Especially is this so unless we practice and follow methods of preservation and utilization. It is exceedingly fortunate that, for 15 years, representatives of the government forestry service have been busily engaged searching for new ways of preserving wood as well as for new ways of using wood and wood by-products.

For a period of years, Carlile Patterson Winslow has been directing the forces of the Forest Products Laboratory in these efforts. Winslow joined the United States Service in 1908 and for several years was engaged in the installation and experimental operation of wood-preserving plants. When he became director of the Laboratory in 1917, he immediately placed the facilities of the laboratory at the disposal of the War and Navy Departments for war-time emergency research in forest products. During this period, and since, under Mr. Winslow's direction the Laboratory has gained much of the prestige which it at present holds.

While much of the work of the Laboratory has had to do with wood used in industry, considerable attention has also been given to the problems of the use and preservation of wood on the farm.

ENGINE GAS A DANGER TO COWS

A dairy farmer of Dodge county, Minnesota, came near losing a number of valuable cows as a result of operating a small tractor for grinding feed in the dairy barn. As a result of the production of carbon monoxide gas, nine of the cows were temporarily paralyzed. The farmer, as soon as he noticed the trouble, opened the barn doors and called a veterinarian. Farmers who operate gas engines in barns should keep in mind that the combustion products from these machines are dangerous when there is little ventilation.

The West Follows

By F. L. Ballard

County Agent Leader, Corvallis, Oregon

IN the relatively new farming areas of the Pacific Northwest, commercial fertilizers have never yet attained first importance in farm management plans. To the Eastern farmer accustomed to fertilizer applications as regularly as the seed is planted, the growing of good crops on extensive acreages without any fertilization in this newer region has been a source of wonder. As time passes, however, the inevitable is being faced in increasing degrees.

Commercial fertilizers are coming to the fore here as elsewhere, first, of course, with crops that accompany intensive farming plans. Take potatoes, for instance. In the lower Willamette valley regions of Oregon, the experience of potato growers for the past three or four years indicates definitely the profits of light applications of complete fertilizers. Five-hundred-pound applications of 6-7-8 or 3-10-10 fertilizers have returned remarkable profits above the cost of fertilizers.

Herbert E. Pauley of Multnomah county, Oregon, made rather careful checks on his operations last year and found the profits above fertilizer cost running approximately $45.00 per acre, as a result of light fertilizer applications. Other checked results are comparable. The conclusions rapidly being formulated in these regions are that a high grade commercial fertilizer used in applications up to five or seven-hundred pounds per acre is a profitable practice.

Over east of the Cascade mountains in central Oregon, heavier applications are proving profitable, a thousand pounds per acre of a high grade complete fertilizer giving very profitable returns here. Particularly valuable is the application of fertilizer to early potatoes. Of this crop the real early market is the profitable one, and fertilizer applications are found to hasten maturity from a week to ten days, which is an important factor in the marketing of the early crop.

Abandoned Farms or Forests—Which?

(*From Page* 21)

land again covered with tall and valuable trees.

In another half century there will be mixed stands of hard-woods towering 50 feet in height with trunks a foot in diameter where these bare fields now are. There will also be pure stands of white pine with straight trunks reaching 70 feet into the sky as monuments to the forethought of such men as Mr. Sanbury and others. Also there will be stands of red pine equal in size to the white pine and the red pine lumber will be valuable, too, even though its quality is not quite so fine as that of the white pine. The European larch will be there, and in a half century larch will have replaced our chestnut of today for posts and poles.

Any one who establishes a forest of this kind engages in a work that is of direct social and ethical value to the community in which his property lies.

Potash for Corn

(*From Page* 11)

pounds per acre, while the smallest stalks were the product of a plot to which no potash had been applied.

The plot that received the heaviest application of potash not only developed the largest, healthiest stalks, but also produced the greatest yield. Ducke demonstrated in impressive fashion that on muck soil potash increases both the yield and size of corn. Corn-stalk tests by the new Hoffer method made in the three plots on the Ducke farm by Dr. C. T. Gregory, extension pathologist of Purdue University, confirmed the results of the demonstration, since the tests on the stalks in the plot that had received no potash showed potash deficiency, while the stalks in the other plots showed no evidence of potash hunger.

Ducke is planning on conducting a number of other fertilizer demonstration in cooperation with the county agent.

Fruit Tests Show Need of Potash

(*From Page* 17)

gave an equally foolish answer.

Fertilizer	Peach	Apple
L, P, K	286 feet	83 feet
L, N, P, K	206 feet	68 feet
Decrease for N	80 feet	15 feet

In this experiment, where the plots received the same fertilizer treatment for a long period, nitrogen in addition to phosphorus and potash did not increase the tree growth but gave an actual decrease in the total shoot growth of both peach and apple trees. The foregoing comparisons show that chemical analysis of soils is not a safe guide to fertilization and that there are cases where nitrogen is not the limiting element of plant food for fruit trees.

Those fruit growers who have followed thus far probably feel the same as the man who was unexpectedly called on by the toastmaster at a banquet. He replied that he could neither speak, sing, or dance, but he did have a trained flea named Tommy. He proceeded to show Tommy off till a gust of wind swept the flea away. Finally, after a thorough search, a flea was found on one of the guests and returned to the head table. This flea, however, would not do any tricks. At last the man said in a heart-broken tone, "This is not my Tommy." These results may not apply at the present time to the orchards of New England. Nitrogen alone may be all that is needed.

The continued use of this element alone will eventually lead to the exhaustion of the available supply of the other plant food elements. When this stage is reached, it will pay fruit growers to use something besides nitrogen. This experiment shows that lime, phosphorus, and potash will play an increasingly important role in orchard fertilization, and that for best results they will have to be used in combination. Test plots are being established with some of the leading fruit growers of southern New England this spring to see if it is time to start a different system of fruit fertilization. The results of these tests will be of interest to all fruit growers.

Know Your Soil Type

(*From Page* 28)

A definite knowledge of the soil types of the area in which he works is essential to every one who deals with the production of plants. The county agent, the agronomist, the horticulturist, the forester, the landscape gardener, the fertilizer salesman—each of these is materially benefited by a knowledge of the characteristics of soil types, their natural vegetation, their crop adaptation, and their fertilizer needs.

The study of the soil types of the United States and their plant-nutrient needs is very little over a third of a century old. The United States Bureau of Soils has classified and mapped soils in every state in the Union and many of the states have cooperated to add materially to the work. The United States Department of Agriculture and the experiment stations of many of the states have carried the work further by making studies of the fertilizer and cultural needs of the different soil types. These studies have been of considerable value, as is indicated by increased average yields per acre of the crops especially studied in relation to soil types.

In all regions, except those of unusually fertile soils or areas infested by injurious insects, there have usually been small average increases in crop yields due to generally improved agricultural practices. At times there have been marked increases in yields of special crops grown on a limited number of closely related soil types; general information in such cases being practically specific because of limited variation in soils.

The most consistent increases, however, have been in areas where special soil type studies have been made and where the results of such studies have been broadcast to the farmers. North Carolina is an example of this.

According to the 1925 Yearbook of the United States Department of Agriculture, the average yield of cotton per acre in North Carolina for the 10 years from 1886 to 1895 was 171 pounds. During the 10 years from 1914 to 1923, after a good deal of work had been done with fertilizers for cotton on different soil types, the average yield was 258 pounds per acre, an increase of more than 50 per cent.

In contrast to this, a neighboring state with naturally more fertile soils and consequently less interest in fertilizers, and apparently less interest in soil types, averaged 165 and 180 pounds of lint cotton per acre respectively for the two periods. This increase of 15 pounds per acre probably represents a general improvement in farm practices partly offset by boll-weevil ravages. North Carolina's increase is due in part to the same cause and to the the use of better seed and better varieties, but for the most part is the result of a definite knowledge about the fertilizer needs of cotton gained from soil-type studies.

Another Southern state with approximately the same soil types as North Carolina averaged 152 pounds of cotton per acre during each of the two periods. In this case the loss due to the boll-weevil exactly balanced the gains due to improved practices. There probably would have been a substantial gain if a systematic study of soil types had been made.

In the case of wheat, the results favor this state rather than North Carolina; the average yields for the two periods being 6.1 and 10.1 bushels per acre respectively, a gain of more than 65 per cent, while North Carolina's record is 6.2 and 9.8 bushels, a gain of 58 per cent. Improvement in wheat yields may be considered as due to increased knowledge of wheat soils in both cases, since wheat is grown

for the most part on closely related soil types, and general knowledge there becomes specific.

In one of the Northwestern wheat states where the soils are much more fertile than in either of the two Southern states considered, but where the wheat farmer is handicapped by lack of moisture, the wheat yield has decreased from 14.5 to 10.2 bushels per acre during the same period. The 1886-'95 average yields will probably be surpassed when there is a more wide-spread use of commercial fertilizers, attention being paid to the special needs of individual soil types, coupled with a general improvement in soil-building practices.

Increased Yields

Corn yields in North Carolina have increased from 12.4 bushels per acre during the earlier 10-year period to 24.4 bushels during the later period. In another Southern state with similar soils, the increase has been from 11.2 to 14.4 bushels per acre. In still another Southern state with much better corn soils than either of the two just mentioned, the increase has been from 21.5 to 25.3 bushels.

North Carolina's increase of more than 64 per cent, contrasted with the others of 29 and 18 per cent, shows the value of individual soil-type studies when compared with the more general methods of soil improvement used in the other states. Unlike wheat, corn is grown on a large number of soil types, having a wide range of characteristics and varying in cultural and fertilizer needs.

These increased yields, due largely to soil-type studies, show that something has been accomplished. But when compared with the much larger yields obtained by many farmers, they indicate that there is still a great deal to be done. Cotton yields of a bale to the acre are not uncommon in any of the Southern states, and wheat yields of 25 bushels and corn yields of 50 bushels are not infrequent.

The farmers who obtain these higher yields are specialists in producing crops from their particular soil types. They know their soil types thoroughly and understand the best methods of handling and fertilizing them.

That soil types occurring near together are widely different in their fertilizer requirements is quite evident from North Carolina experimental results. The Cecil clay loam, a widely distributed Piedmont soil type from granitic rocks, has been found to require relatively heavy applications of phosphoric acid, while its requirements for potash are very low. The Iredell loam on the other hand, a soil type resulting from the weathering of basic igneous and metamorphic rocks, which may occur on the same farm with the Cecil clay loam, responds very little to phosphoric acid and requires heavy applications of potash. In some localities where the farmers have not followed the recommendations of the state experiment station, it is customary to use an 8-2-2 fertilizer with additional superphosphate. This has worked fairly well on the Cecil soils, but farmers on the Iredell soils who have tried this have very little good to say about fertilizers. The reason is obvious. If they had reduced the phosphoric acid of the fertilizer considerably and added to the potash proportionately, the results would have been different.

The Norfolk sandy loam, a gray sandy soil with a yellow sandy clay subsoil, of the Coastal Plain contains very little phosphoric acid as shown by chemical analysis. Yet experiments show that it requires less of that ingredient in the fertilizer than the average soil, in fact, much less than the Cecil soils which average about three times as high in content of phosphoric acid as the Norfolk. The Durham and Norfolk soils have about the same potash requirement, although chemical analyses show that the Durham sandy loam may have 10 times as much potash as the Norfolk

sandy loam. Both of these soils have been found to need magnesia for tobacco.

Experiments show further that the fertilizer needs of a soil may differ with different crops. The Cecil sandy loam needs 4 or 5 per cent potash in the fertilizer applied for tobacco while 2 per cent is sufficient for corn and small grains. Cotton will not grow successfully on the Alamance silt loam without heavy applications of potash, while corn and oats require very little of this ingredient in the fertilizer.

It is generally conceded that certain crops are especially adapted to certain soils. Wheat is said to be adapted to heavy soils, corn to medium-textured soils rich in organic matter, peanuts and bright tobacco to light sandy soils. However, the growing of crops is not restricted to soil types to which they are especially adapted. Many crops are grown on a very wide range of soil types. In North Carolina corn is grown on every soil type which has any agricultural value. Cotton is grown on practically all of the soil types outside of the mountains, where the climate is unsuited to cotton. Wheat is generally restricted to the heavier soil types, but is sometimes grown on the lighter soils as well. This shows that you cannot fertilize strictly for the crop, but must consider the proper fertilizer formula for a certain crop on a certain soil type.

Variety tests of crops carried out by the state experiment stations show that the results at different stations do not always favor the same varieties. This may be due in part to climatic differences, but it is undoubtedly due in many cases to variations in the other important environmental factor, the soil. It is very probable that different varieties of the same crop are adapted to different soil types, and that average per-acre crop yields will increase still further when we learn more about which varieties are best adapted to each important soil type and help the farmer get good seed from adapted varieties grown on his type of soil.

The time will come when the agronomist will be expected to know the soil types of the region in which he works, just as the dairy specialist must know the breeds of dairy cattle and the poultry specialist the varieties of chickens. When that time does come we may expect to see a big step forward in our progress in agriculture.

America's Markets

(*From Page* 10)

even 10 high,—baskets of tomatoes, cantaloupes, sweet corn, cucumbers, and many other products. About the only other package is the berry box for berries and cherries. Teams and trucks rumble up and down the streets. Shortly before the market opens prospective buyers scurry up and down the narrow aisles on the sidewalks, getting a line on what they want and where to get it first. They carry shipping tags, each tag bearing on one side the printed name of the firm from whom goods are bought, and on the reverse side is penciled by the seller the kind and quantity of the lot. After a buyer has made his purchases, he hands the tags to his truck driver who makes the round of the stores and presents the proper tag, which is a form of receipt.

The ideal in modern terminal construction is the erection of wholesale markets and unloading tracks in a single unit, to eliminate the primary haul from tracks to market. In smaller cities the jobbing and farmers' markets would be added to this unit, thereby concentrating the entire produce business and eliminating both pri-

mary and secondary haul. Geographical lay-out and the preemption of favorable market sites make this ideal impossible of achievement in many instances, but wherever possible the railroads, pressed by the need for replacing obsolete terminals to meet modern conditions, are endeavoring at least to approximate it.

The new Pennsylvania terminal at Philadelphia embraces three mammoth buildings, each 800 feet long and 110 feet wide. The platform floors of each building serve for the unloading of freight, and are heated. The second floor of one of the buildings contains two auction sales rooms. Each building is served by four tracks, affording space for the simultaneous unloading of 2½ miles of freight cars. These tracks are of the girder-rail type, permitting vehicles to reach both sides of the platforms after cars have been unloaded and removed.

A team track delivery yard contains 17 tracks, each with a capacity of 30 cars or a combined capacity of 510 cars, with paved driveways 65 feet wide between the tracks. Between each pair of tracks, inspection platforms protected from the weather and electrically lighted, on a level with the car floors, are provided. The projected cold storage warehouse 250 feet long, 110 feet wide, and 8 stories high will be a part of the unit. The terminal is located immediately adjacent to a large terminal yard in which direct train movements from the west and south terminate.

Verified Seed Origin

(*From Page 26*)

or other container, or may be used as an invoice certificate mailed with shipping documents. The tag certificate gives the name and address of the verified-origin seed dealer, the kind of seed, lot number, and locality where the seed was grown. It is attached to every bag in shipments made to purchasers who are not verified-origin seed dealers. The invoice form of verified-origin seed certificates is used chiefly in transactions between verified-origin dealers.

An emblem in the form of a shield with the words "Verified-Origin Seed" superimposed upon the letters "U S" has been adopted for use by verified-origin dealers in lettersheads, tags, circulars, catalogs, and newspaper advertising.

This service is the outgrowth of many years of work and study on the part of W. A. Wheeler and G. C. Edler, of the Bureau of Agricultural Economics. Together they formed a pioneer group in seed marketing work. Through many preliminary surveys they collected information on which many improvements have since been built. From the beginning their efforts have met with hearty response from the trade, in the large majority of cases.

Basic to any effective plans for improvement was the determination and charting of the areas that normally produce a surplus, a sufficient, and an insufficient quantity of each of the most important kinds of field seeds. These results have been reduced to map form for graphic effect, and these maps have been in great demand. Devious routes from seed producer to consumer have been considerably shortened as a result.

As the seed business is international, there was need for accurate foreign information. War-time effects on the seed industry were given first-hand study by Mr. Wheeler, when the Department was authorized by law to conduct seed surveys that the government and the public might know of any shortages or surpluses that might

affect the production of crops to feed this country and our allies. In 1924 the Department decided to supplement foreign information gained at that time by a study of foreign seed conditions in normal times.

Seed Reporting Service

Where in Europe are largest quantities of agricultural seeds produced? What districts produce the best grade of seed? What countries are the chief competitors of the United States in the purchase or sale of various kinds of seed? What kinds and in what countries are American-grown seeds in greatest demand? How does certain seed, found unsuitable for general use in the United States, find its way here? To find the answers to these and many other questions, Mr. Edler made a close study of most of the important seed markets in Europe.

Prior to the World War the United States imported more seed from Germany than from any other country, and yet Germany produced less seed of nearly all kinds than was needed for its own sowing requirements. Recently, partly as a result of contacts made in the foreign studies, a number of countries have been exporting seed direct to the United States, but there still remains a gap to be shortened between the seed producer in Europe and the consumer in this country.

For more than 10 years, the seed reporting service conducted by the Bureau has kept seed growers, dealers, and consumers informed as to the supply of and demand for all the important kinds of field seeds, and their prices and quality. Mimeographed reports are issued as soon as data have been compiled, and during the main seed-selling season weekly seed reviews are broadcast by radio. The foreign studies added greatly to this service, for Mr. Edler was able to arrange for a flow of European information from reliable sources.

Many foreign firms and foreign governmental agencies that cooperate with the Bureau receive these seed reports, which have also a wide domestic circulation. The information for these reports is secured through the cooperation of nearly 25,000 growers and 20,000 shippers of seeds. Information obtained from them is supplemented by first-hand data collected in important producing sections by a representative of the Bureau, by information obtained from state agricultural statisticians, and from special correspondents in this country, in Canada, Europe, South America, Australia, New Zealand, and South Africa.

Kansas' first-prize judging team, International Livestock Show, Chicago.

Reviews

(*From Page* 46)

The Agricultural Outlook for the United States was published by the United States Department of Agriculture. It is a statement of the general agricultural situation and general prospects for the coming year. Several states have also published outlook reports. By making such reports on a state basis, a more local interpretation can be made. Circular No. 68, February, 1928, "Agricultural Outlook for Oklahoma, 1928," by J. T. Sanders, W. W. Fetrow, J. O. Ellsworth, and J. F. Page, of the Oklahoma A. & M. College, Stillwater, Okla., is such a report.

"The cost of Producing Sugar Beets in Northwest Ohio, 1926," Crop Talk, Ohio State University, Columbus, Ohio, No. 42, June, 1927.

"The Agricultural Outlook for Utah, 1928," *Agr. Exp. Sta., Logan, Utah, Cir. No. 70, Feb.,* 1928, *P. V. Cardon and W. P. Thomas.*

"Illinois Crop Reporter," U. S. Department of Agriculture, Washington, D. C., March 1, 1928.

Insects

"How the Boll Weevil Ingests Poison," Agr. Exp. Sta., Gainesville, Fla., Bul. 192, *Jan.,* 1928, *Edgar F. Grossman.*

Business in Farming

(*From Page* 24)

bage, 80 corn, 80 sugar beets, 160 wheat, 100 hay, 30 onion sets, and 15 onion tubers. Rasmussen says his potato acreage varies from 150 to 180 acres depending somewhat on the market. Due to the flood conditions in the Mississippi valley and to the drouth in southern potato growing sections, he put in the maximum acreage last year. To let him tell it in his own words:

"We use plenty of manure and commercial fertilizer on potatoes, as they are heavy users of plant food. About 20 tons to the acre of manure are spread in the fall on clover sod. We then fall plow to a depth of three or four inches and disc it up good so that the manure gets thoroughly mixed with the soil. Then we give it a second plowing, going down eight or nine inches this time. We try to get both plowings done in the fall but if we don't have time, we get it done as early in the spring as possible. Due to our drainage system, we can start working the land early. We keep the disc, drag, and spring tooth harrow busy rooting out the weeds and loosening up the ground to let the air in. I like a loose ground full of humus for potatoes, and our black sandy loam seems to be especially well adapted for growing them.

"We try to cut the potatoes to two eyes, and we treat them for 2½ minutes with formaldehyde heated to 125 degrees. One man can treat 540 bushels in a day if the potatoes are sacked. It takes from 16 to 17 bushels of seed per acre. We plant the rows three feet apart and drop the seed 16 to 18 inches apart in the row. This is farther apart than some plant, but we get better results in a dry season if we do not put them in too thick. We don't care to plant much before April 25 because of the danger from late frosts. Last year we tried to put them in earlier, and they froze down so they came on the market at a poor time.

"We apply an average of 800 pounds of 0-14-14 fertilizer to the

acre in two rows on each side of the spuds just deep enough to reach moisture. We plant the potatoes six inches deep so we can cultivate and run the weeder over them before they come up. We aim to keep all the weeds out and keep the ground loose at the same time. This gives the roots ample room to spread. We spray with bordeaux mixture every 10 days or so for blight and leafhoppers. If we have much rain, we spray oftener. Last year the early ones were sprayed three times and the late ones four times, but we had no beetles so arsenate of lead spray was not necessary."

Cabbages Get Fertilizer

Cabbages follow potatoes in the rotation. As the land is already in good shape for the digging, Rasmussen does not plow the cabbage land until early in the spring. He works the ground until he gets it into excellent tilth before setting. On unmanured fields he fertilizes with 1,000 pounds to the acre of a 3-10-10 mixture, but where manure has been applied he fertilizes with the same amount to the acre of an 0-14-14 mixture. The rows are set 34 inches apart and the plants are put in 20 inches apart in the row. Rasmussen says the retail market demands a medium-sized, solid head weighing from three to five pounds so he grows them to suit his trade. He usually harvests around 18 tons an acre on the average.

Rasmussen figures on getting his next three crops in the rotation with very little fertilizer expense. He plants sugar beets on half of the cabbage land and silage corn on the remainder. The work on the sugar beets is largely done by contract labor, but the same crew that works on the beets also helps with the onion growing and is on hand at potato harvest time. In order to get an even stand and a quick early growth, Rasmussen applies 150 pounds per acre of 3-10-10 fertilizer in the hill with corn and the same amount in the drill rows with the beets.

Lest too rank a growth be secured, Rasmussen says he has to use care in discing the corn and beet ground for wheat so as not to get it too fine. He was expecting a yield of 60 bushels per acre from his wheat last year. Such yields are no longer unusual, he claims. He cuts the wheat with tractor-pulled binders that reap 10 feet at a swath. Then with his own crew and outfit he threshes it as soon as it is ready.

One would think that it would be difficult to get a good stand of hay when the grass seed is sown in with wheat that yields as much as this, but Rasmussen says it usually comes out fine. We walked through weedless fields of hay that cut over three tons to the acre at the first cutting this year. He sows a grass seed mixture of three quarts of timothy, 1½ quarts of alsike clover, and 1½ quarts of red clover.

Grows Many Onions

A part of the wheat land is usually put into onion sets as Rasmussen has long been growing this crop. The sets are sold to seed houses and commission firms at a good profit when they are handled right. Eighty-five pounds of seed to the acre are drilled in four rows at a time, with a horse-drawn planter that puts two rows 15 inches apart and the other two 20 inches apart, so that a four-row horse-drawn cultivator can be used. A ton to the acre of an 0-14-14 fertilizer was broadcast. No nitrogen was applied because the soil is rich and there is danger of the onions lodging.

Rasmussen caters to the early onion market by planting about 15 acres of the sets between April 10 and 15. Many gardeners plant these sets by hand, but Rasmussen puts them in with a horse-drawn planter. He says they are a profitable crop because the onions are ready to market a month

earlier than onions grown from seed, and they require far less weeding. He uses a ton to the acre of 3-10-10 fertilizer as the tubers need more nitrogen than do the sets.

The visit to the onion plots concluded our "tour of inspection" so we drove back to the beautiful, flower-bordered, tree-shaded home where Mr. and Mrs. Rasmussen and their three daughters enjoy all of the modern comforts of living. I thought, as I looked about, that this was indeed a far cry from the time when the builder of this home arrived in America a fatherless immigrant with no assets other than good health, a willing spirit, and a strong determination to succeed.

Beginnings

(*From Page 6*)

remain densely and stubbornly conservative in mind toward the very tools and methods by which they must, if ever, achieve the degree of economic progress which his violent doctrine proclaims as their inherent right.

You cannot reap with a sickle; or plant by the moon; or breed scrub livestock; or grow scabby potatoes, and still have enough spirit left to tackle the problems of world agriculture.

You cannot mend shoes with an awl; or churn with a dash; or travel with a buggy, and proclaim at the same time that you are a foe of discarded theories and the champion of progress.

THE real trouble with many of our progressive reformers has been that they have compromised with "defeatism;" were catering to mildewed conservatism whilst they inveighed against the conditions arising from the same lethargy of mind and submergence of spirit.

Hence when we cling to beginnings on the one hand with all the fierce ardor of provincialism, and then announce our intention to break away from the paths of beginners, we are in a modern muddle. We then find ourselves like the young man who has invented a machine by means of which he would hurl himself into the planetary arms of Venus. He wants to outdo Lindy, but he will not be able to escape the law of Newton.

The genesis of things, of life, and of thought are beginnings. Man and nature are undergoing such constant transformation that it is impossible to isolate the very essence of any beginning so as to establish positively that the original start was made from that one condition or point alone.

Every effect has a cause, or several causes; and although science has found life atoms at their sources, nobody has found definitely how and when life was first created.

Science itself in all its manifold branches and crafts is a scroll of progress based on the law of cause and effect; but who can trace science down to the root hairs of its conception?

What we trace as the visible growth or change of natural phenomena is merely progress. We know fairly well what hastens or halts such progress, which is after all an accomplishment of momentous value to humanity.

Many guesses have been made, for instance, as to the origin of the red Indian of North America. We know that he believed in as many witches and demons as our Salem ancestors, with a thousand totem poles, medicine drums, and war bags thrown in to boot. We know that he was astounded at the white man's fire-arms and paralyzed by the white man's fire-

water. We are aware that he sold Manhattan Island for a modern bell boy's tip, and that he never knew the traction power of the revolving wheel, so his ponies or squaws dragged the household luggage behind them on poles.

YET in the spring of 1928, about three hundred years after the first wide influence of white culture became known in America, we behold an American Indian from Colombia presiding over the European League of Nations! We have accepted Will Rogers, of Choctaw breeding, as the keenest of our modern philosophers of persiflage. And furthermore, have you ever heard a bona fide red Indian complain of the unrighteousness of the 18th amendment?

Your ancestors and mine used to say that the only good Indian was a dead one. It is so much easier to make an end of things than to create new beginnings out of the same raw material. The white man's efforts to crush out and push aside the Indian and the forests were evidences of progress to his mind. Today we admire a good Indian and a noble tree, because both are scarce and we badly require sound citizens and profitable timber.

Sometimes we dearly desire to make beginnings out of the things we wished to see ended a little before. The effort to establish great forests is a case like that.

My absent-minded neighbor, the local historian, points to our old court house and imagines he can name the men who built it. Even inanimate things, like court houses, are mighty hard to trace back down to the last brick and nail. It is really a job for the geologist, and when he gives up, call in the paleontologist or the astronomer.

I picked up a piece of mortar in the ruins of an old French fort near Amherst, Nova Scotia, and wondered about the fellows who mixed it. I could see the ending of it pretty clearly, but I failed in sensing its beginning. That lime, that once came from the land, was headed back to the land. Would the soil grains it met ask of it how much it had accomplished as a servant of mankind during the two hundred years of its absence?

I have good friends delving in museums, and others bent upon sudden treks to the unknown lands with Andrews and other fossil hunters; well and good, no doubt they are seeking beginnings of life that may contribute somewhat to the keeping qualities of ours. I have good chums poring over tomes in musty history research, and opening old attic trunks amid a shower of dust and dried rose petals; splendid determination, possibly worth rewarding.

But my contention is that it is useless to conjecture long over the faded past unless there is something tangible in it to help us conquer the present and challenge the future. The past is merely a part of us that has passed away, even as the future is a part of us that is yet unborn.

MEN of various faiths and creeds are greatly given to wrestling over beginnings. The generalities of the first chapter of Genesis satisfy the Christian and the Jew alike, but they split wide apart over the deeper and more significant beginning of a new deal for humanity as related in the four gospels.

I thoroughly enjoyed the comradship of a little Arab from Cairo for a fortnight. We warmed each other's hearts over trivial discussions of our families and our gardens, but when we talked of the origins of our religious faiths we soon found that the Koran and the Bible led us to think along divergent ways.

Both of us were living as best we knew how in the absorbing present, but we drew apart as strangers when the mystery of our beginning and ending was mentioned.

Thus it is apparent that the things we know least about are the most potent causes of opposite opinions.

Yet despite these orthodox mysteries, I do not hold it disloyal to anything that I love to regard each morning as a beginning and each evening as an ending. If during that short interval of time and thought I can perceive some hopeful signs of growth that I have been in some measure instrumental in bringing to pass, then I shall not have begun or ended wholly for naught.

I am quite satisfied that my friend who worships Mahomet believes in much the same principle as he whacks his dusty camels toward the pyramids of Gizeh across the desert of his daily desires.

Abortions in the physiological sense are unfortunate enough, but an aborted idea or a thwarted ideal retards progress to a thousandfold greater extent.

Long before you and I read the teeming pages of Jules Verne with its marvels of imagination, there were equally wonderful inventions afloat in the minds of far-sighted, restless men.

Robert Fulton is known for his pioneer steamboat on the Hudson, but very few of us are aware that Fulton invented a submarine boat good enough to sink two French vessels in a demonstration for the purpose of selling the invention to Napoleon. He was at last financially persuaded to scuttle his demoniac discovery somewhere at the headwaters of the Hudson so that it might never become a threat to the commerce of the seas.

There are countless instances more graphic than this to show that a new idea or an unusual conception of an old theory meet with stubborn resistance that often leads to abortion.

Greed and rankling conservatism, doubt, fear, selfishness and sloth all pounce upon the tender beginning of a new idea and crush it down to oblivion, if possible. That is why Columbus and the Wright Brothers had such a hard time convincing their generations that the world was round and that men could fly.

And who knows, perhaps that is also the reason why George Washington never enjoyed a flivver ride or saw a motion picture show! There are many life secrets not written on epitaphs, and we do not know how many fine ideas have died a-borning. Every seed must have the soil, or it forever remains inanimate.

I firmly believe that there are two classes of people in relation to the acceptance of new beginnings. There are the "Tut, tut" class and the "Toot, toot" crowd. To be forever deploring and discouraging, to remain skeptical and analytical in the face of each and every untried plan, is certainly not as praiseworthy as to climb aboard and open the throttle.

I would rather have my obituary read: "He tried and failed" than to have it say, "He never did a gosh darn thing."

WINTERKILLING is the topic of the hour as we go afield with the soil-wise husbandman. He stoops and peers with expert eye at the stooling crowns of the ambitious meadow plants, in an effort to detect what chances remain for a renewal of life after the long hazardous winter.

Sometimes it seems to him as though the copy-book adage was much shaken to pieces by what he observes in the reduced growth following good seeding. He is almost convinced that a good beginning means a bad ending.

But he knows, and we all rejoice at the fact, that a poor ending does not preclude another, and a better, beginning.

If this is true of farmers and their guiding life philosophy, is it not likewise true of county agents, merchants, teachers, and even hapless essay writers?

In other words, there is something new left for us to do as long as we can still smile and spit on our hands!

MORE WAYS THAN ONE

The new minister, his wife, and little boy, Wesley, were expected as company at the Miller Farm and Mrs. Miller was trying to impress upon her young son, Grant, the importance of his being on good behavior while the visitors were there. Of late little Grant, who was not quite three years old, had been showing a proficiency in the use of strong language that his mother did not consider very flattering to the family reputation, and so she addressed her young hopeful as follows: "Now Grant, dear, you will be a good little boy, and not swear while Wesley is visiting you, won't you? Because you know that if he learns to say naughty words, his mother will have to whip him, and you wouldn't want that to happen." To all of which little Grant paid very careful attention and seemed very much impressed.

The Reverend and his family arrived and soon the two boys were out playing in the yard. It was not long, however, before everything was not going quite right for the wee Grant. Wesley was quite a little the bigger of the two, a rough young tyke and inclined to carry things with a high hand. Finally, Grant could stand it no longer, and squaring up to the bold Wesley, he said "I'll trim you." To which the latter replied, "Huh, you can't. You're too little." Grant seemed to think the matter over for a few seconds, and then came out with "All right then, damn you, I'll teach you to swear and your mother will trim you."—L. D. McCLINTOCK.

NOT KEEN FOR CHAMPIONSHIP

Higgins' wife had just presented him with triplets, three bouncing boys, and his employer congratulated him heartily on the event. The following day he was called into the office and handed a silver cup in recognition of the triple blessing he had bestowed upon his country. Higgins received the gift in a rather embarrassed manner, and turning to his employer, he said:

"Thank you very much, sir. But —er—is this cup mine now, or do I have to win it three years in succession?"

"I wonder whatever's become of the girl who used to drop her eyes, raise her face timidly and murmur: 'You'll have to ask papa.' "

"She's got a daughter," answered the up-to-date matron, "who shouts: 'Shove her into high, kid! The old man's gaining on us!' "

She was in Alaska looking over a fox farm. After admiring a beautiful silver specimen, she asked her guide: "Just how many times can the fox be skinned for his fur?"

"Three times, madam," said the guide gravely. "Any more than that would spoil his temper."

AT THE ZOO

"Little girl, why are you so interested in these birds?"

"Well, I just learned that there ain't no Santa Claus and I'm out here to investigate this stork proposition."

Guard against
HUNGER SIGNS

A POTATO plant should have available for its use ample quantities of a well-balanced fertilizer. Unless it has nitrogen, phosphoric acid, and potash in correct proportions, hunger signs are apt to appear.

When nitrogen is needed, the plant lacks vigor and leaves turn yellow. Delayed maturity is a sign of insufficient phosphoric acid. Potash hunger signs appear in the foliage. The leaves develop a bronzed and yellow color, the leaflets hang limp, and the vines wilt.

Feed your potato plants well and keep them healthy. Don't let them become so starved as to show these signs. Field demonstrations have shown that complete fertilizers containing 80 to 100 pounds of actual potash per acre bring good returns.

On this basis at least 1,000 pounds per acre of a high-analysis, complete fertilizer, containing 8% to 10% potash, or 2,000 pounds per acre, if the potash content is 5%, are required for profitable returns. Where from 8 to 10 tons of manure are used per acre, the above rate of application can be reduced one third.

Our booklet, "Better Potatoes," will be sent you free on request.

Agricultural and Scientific Bureau

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